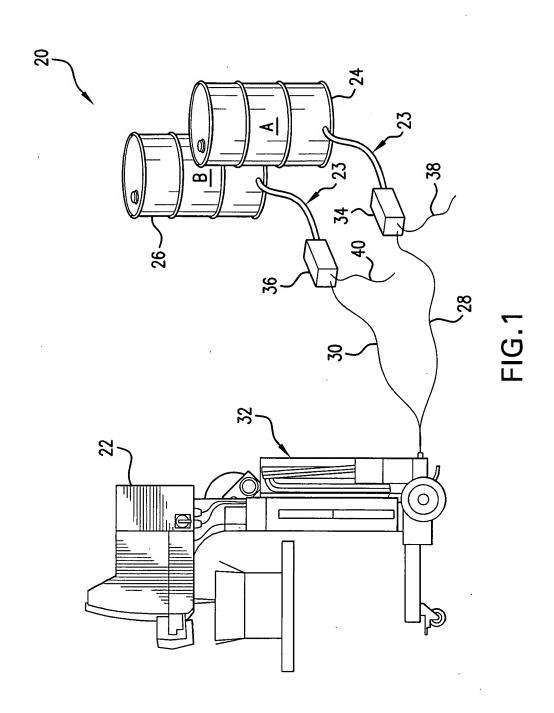
U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
REPLACEMENT SHEET

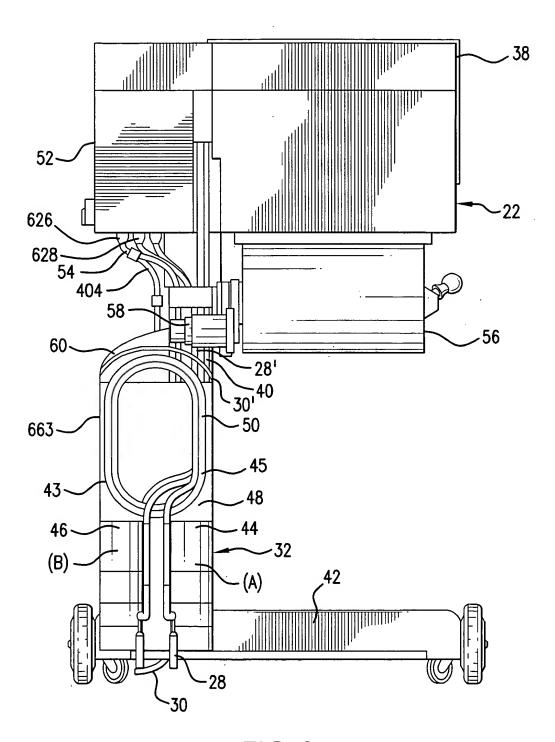


FIG.2

Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

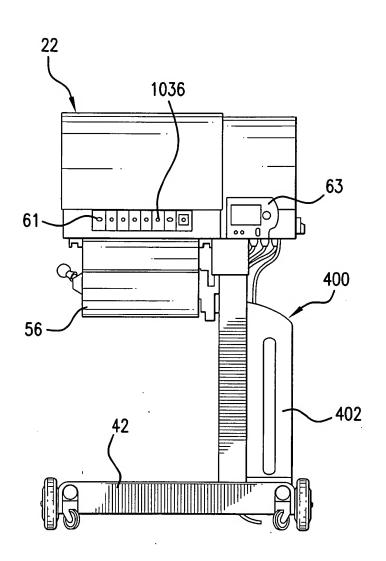
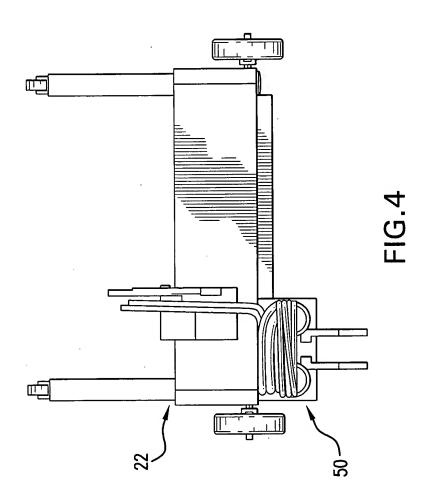


FIG.3

U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM Attorney Docket No.: 034017R004

REPLACEMENT SHEET

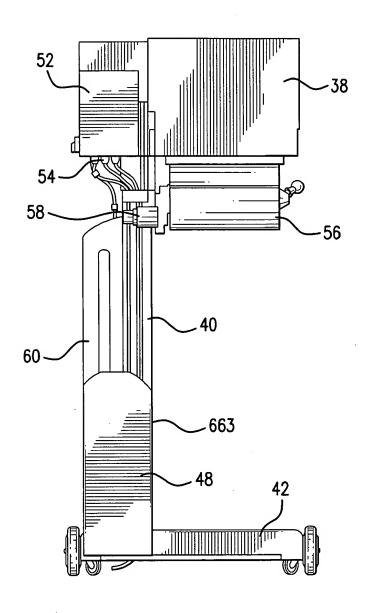
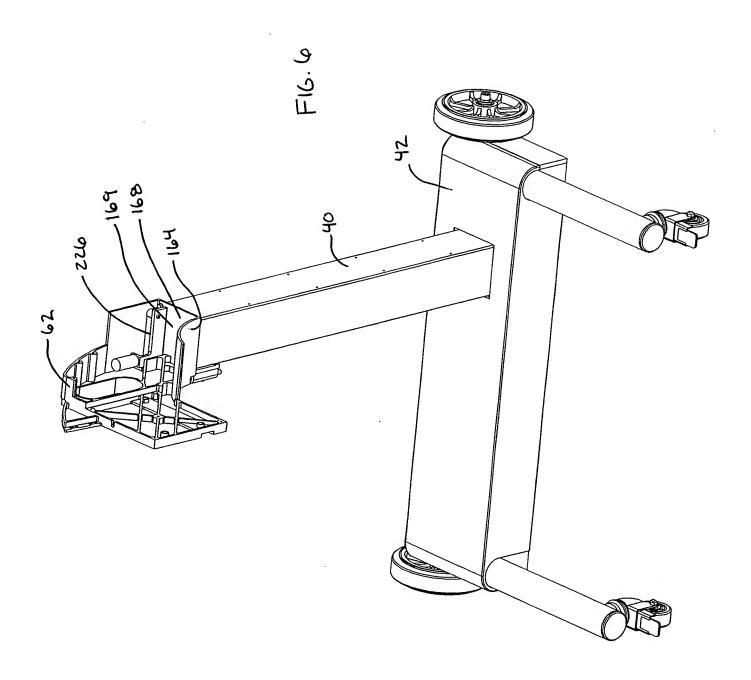
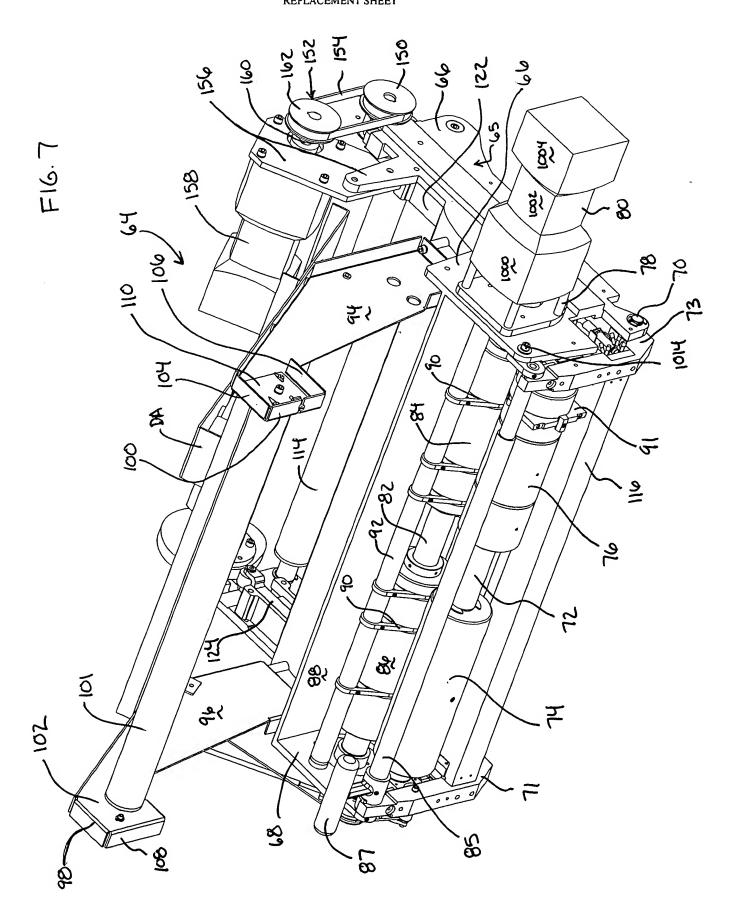


FIG.5

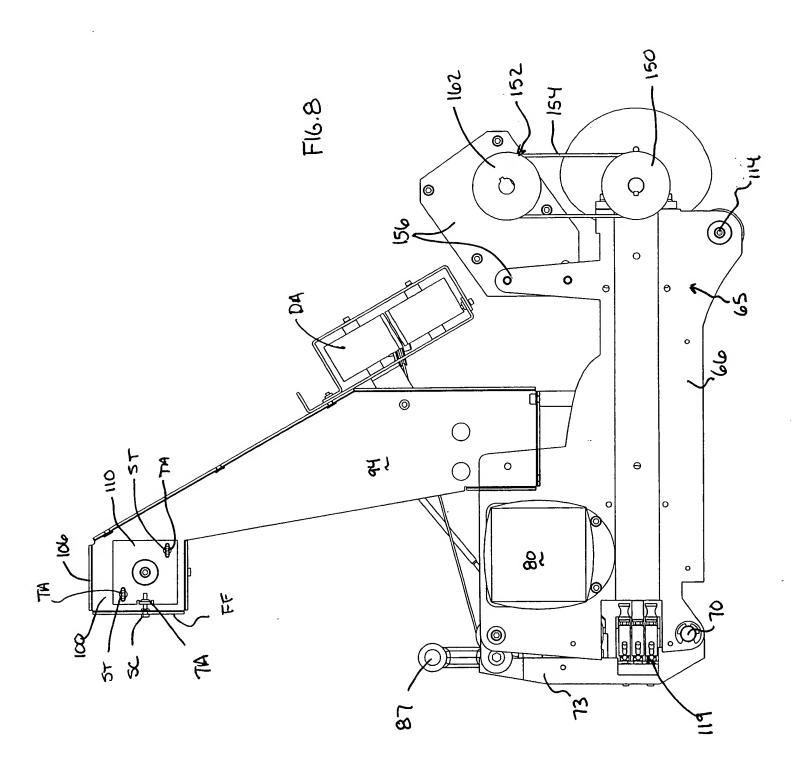
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
REPLACEMENT SHEET



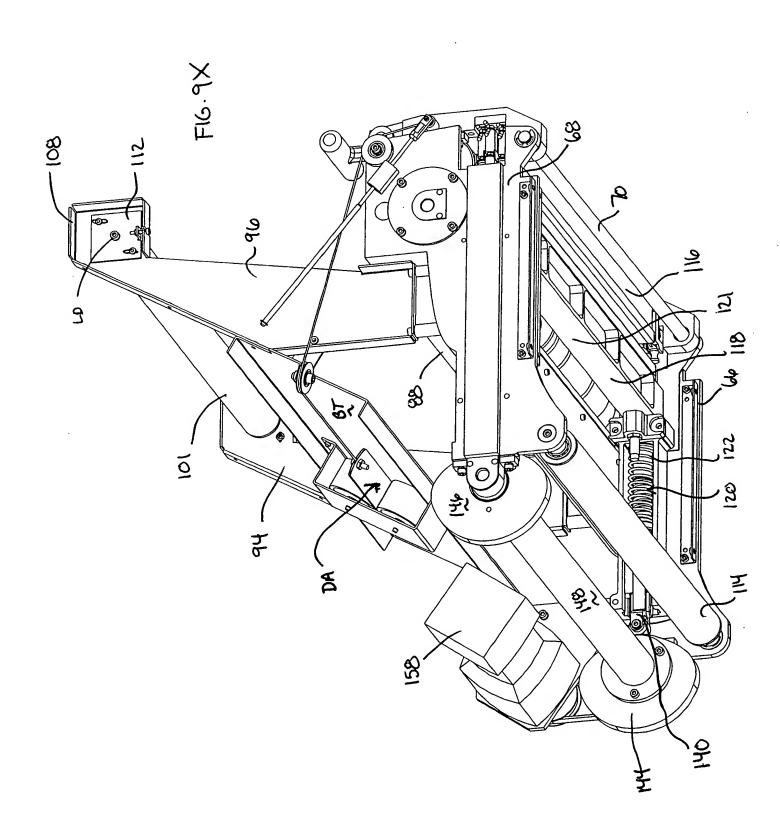
U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
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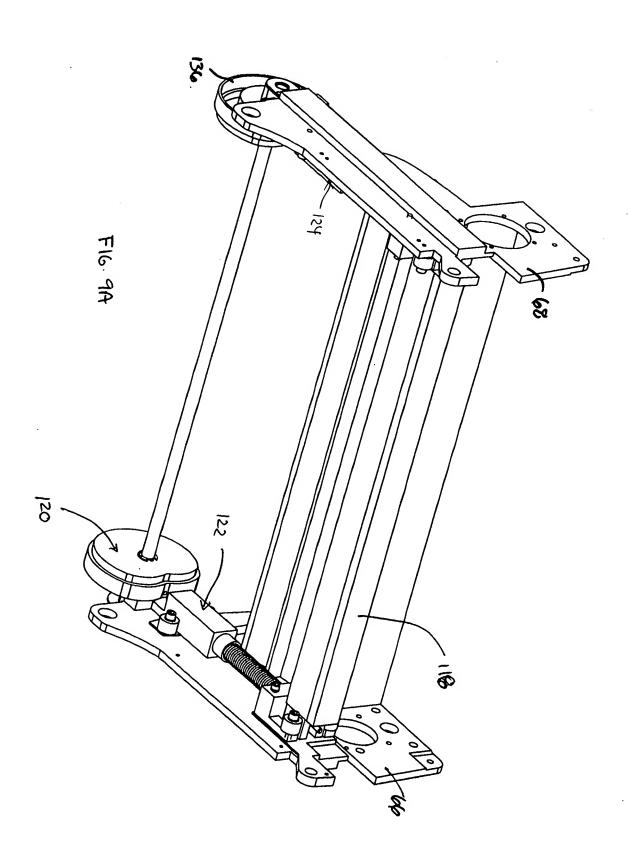
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



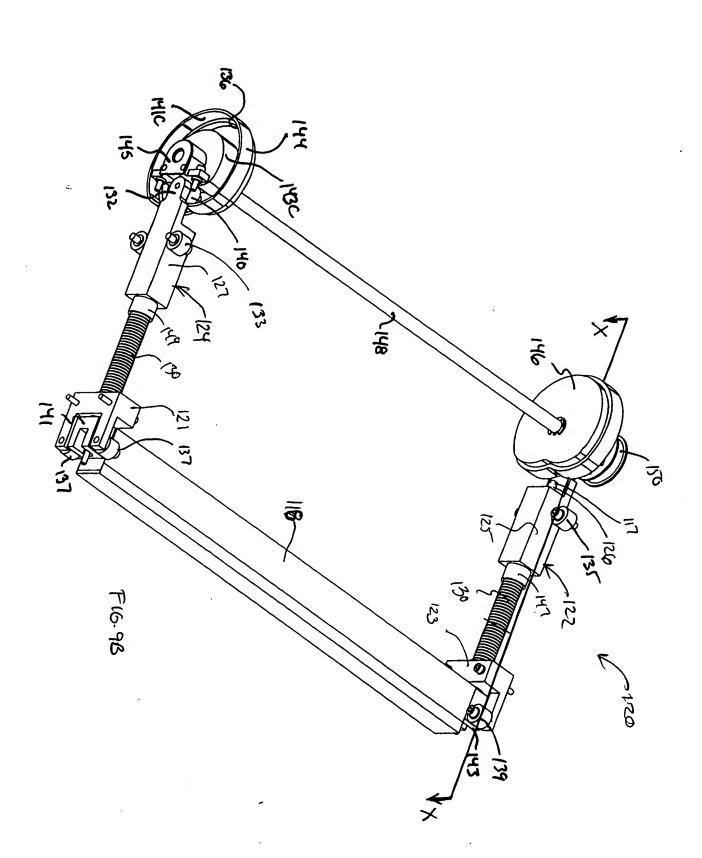
U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



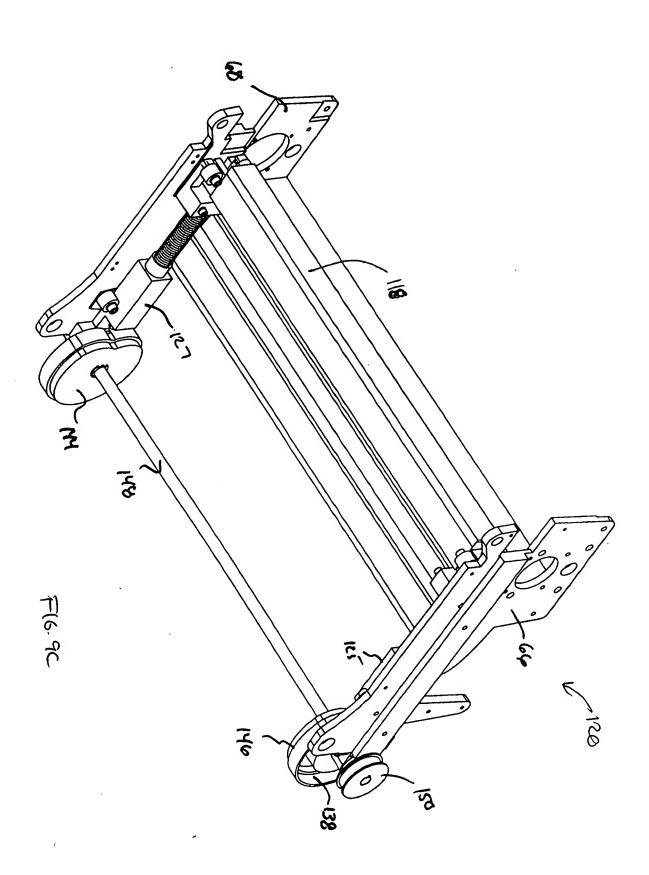
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Attorney Docket No.: 034017R004
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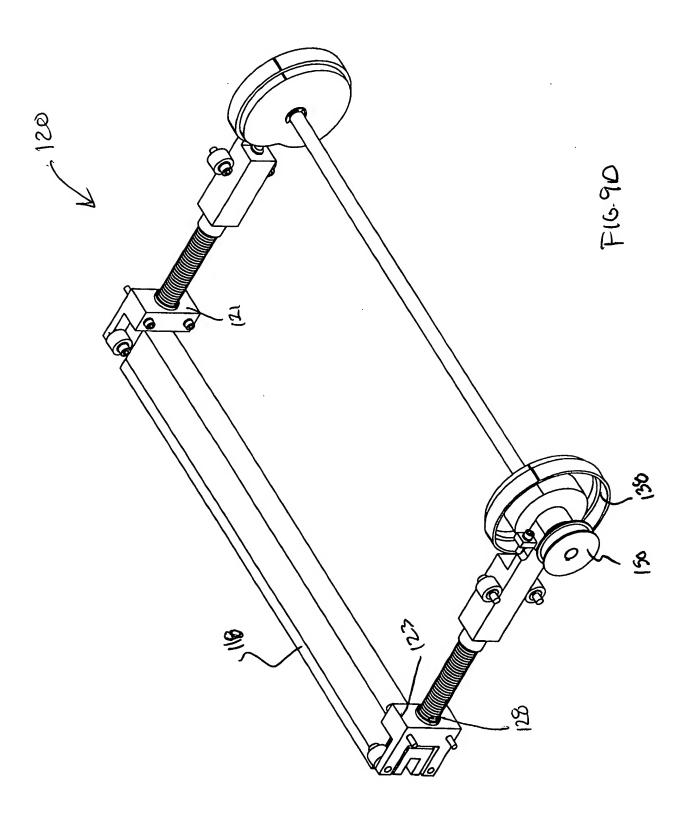
U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
REPLACEMENT SHEET



U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
REPLACEMENT SHEET

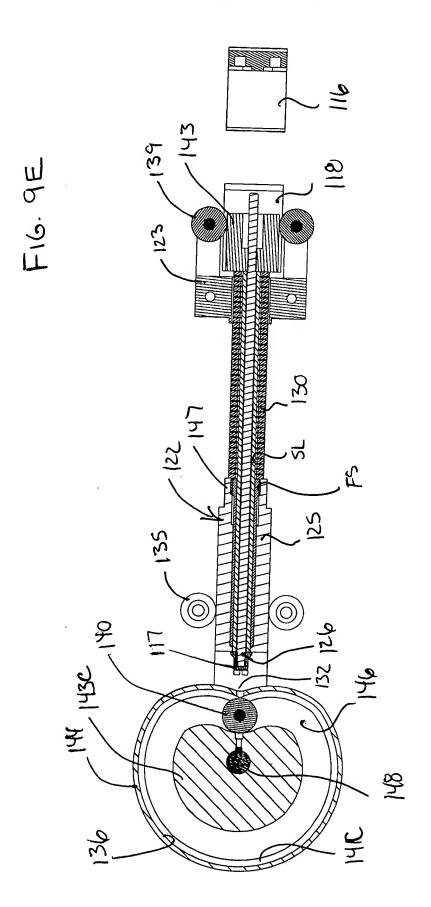


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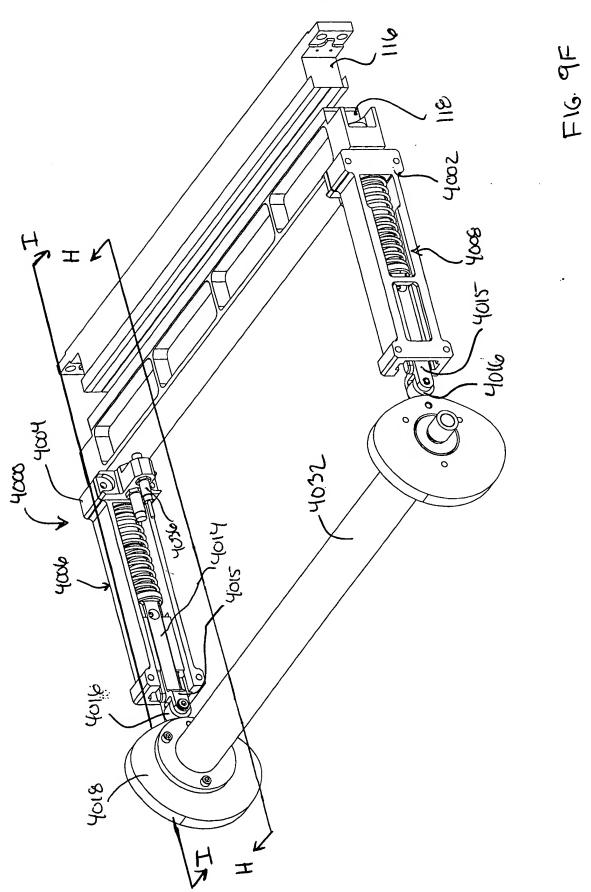
U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
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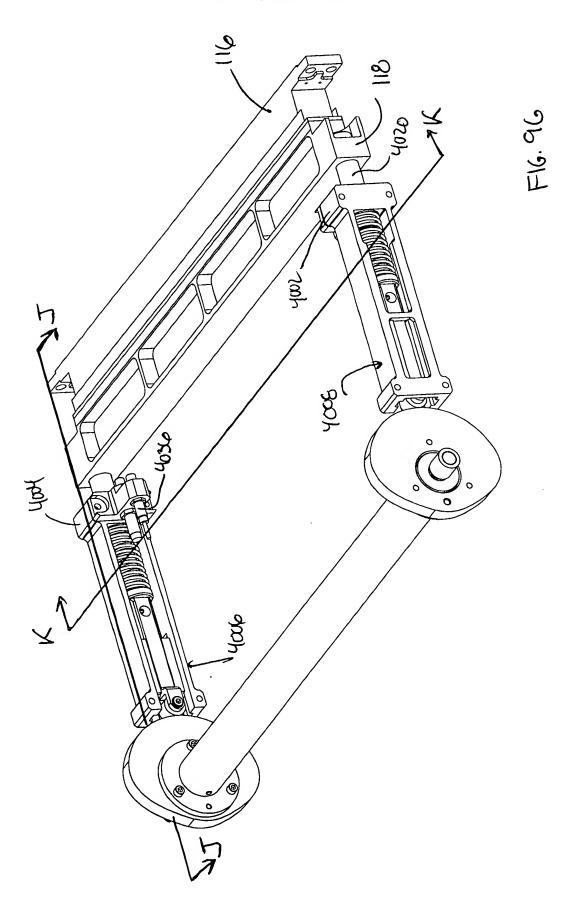


Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM Attorney Docket No.: 034017R004

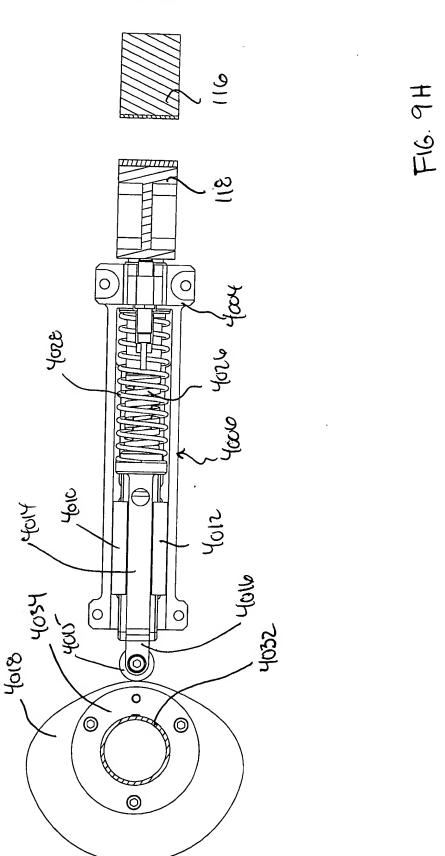
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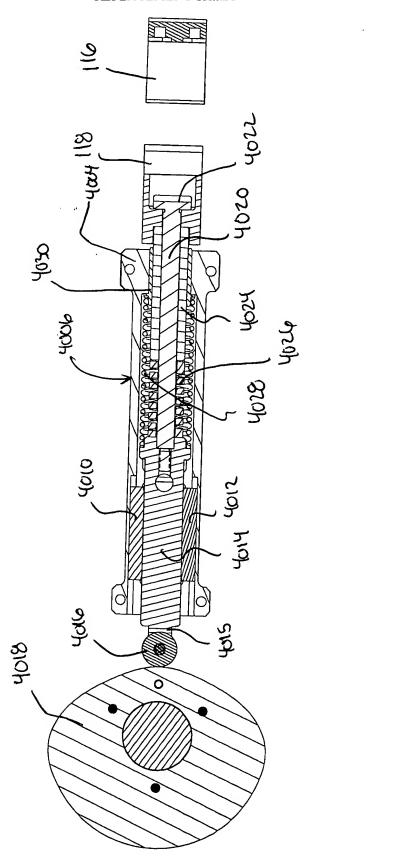
U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



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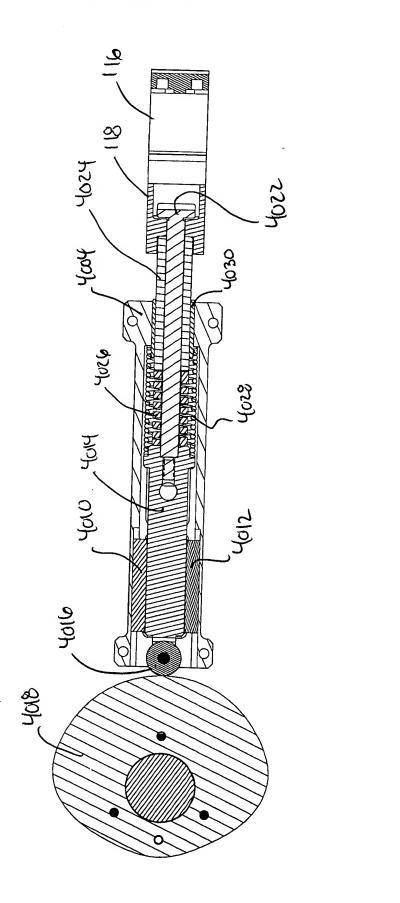


Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



Inventor: George BERTRAM

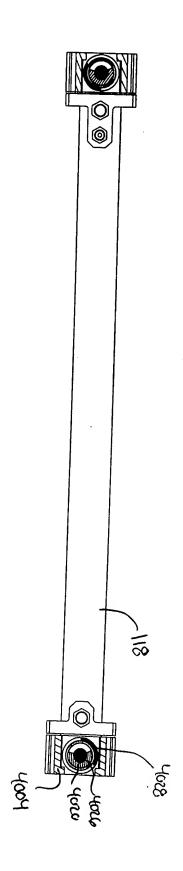
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



Inventor: George BERTRAM

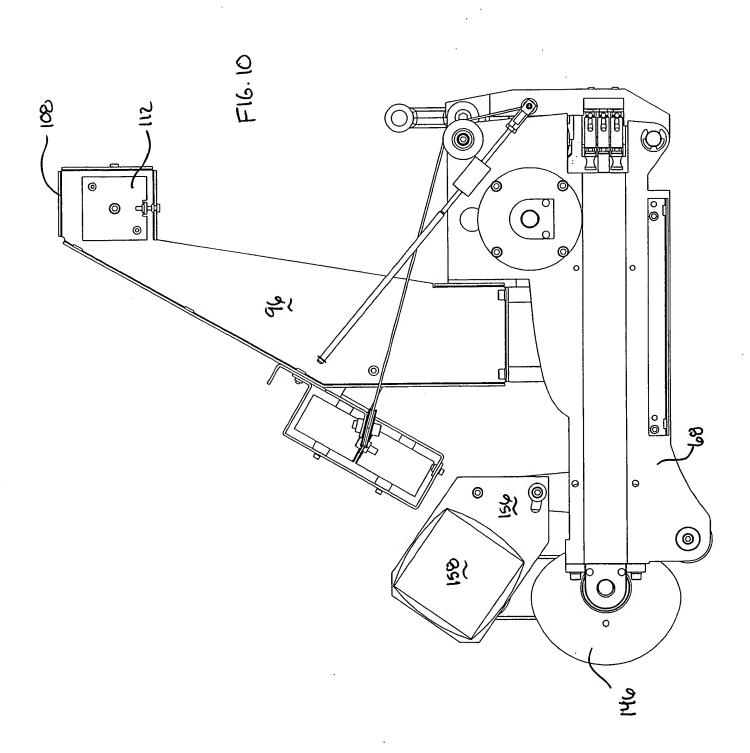
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

Attorney Docket No.: 034017R004 REPLACEMENT SHEET



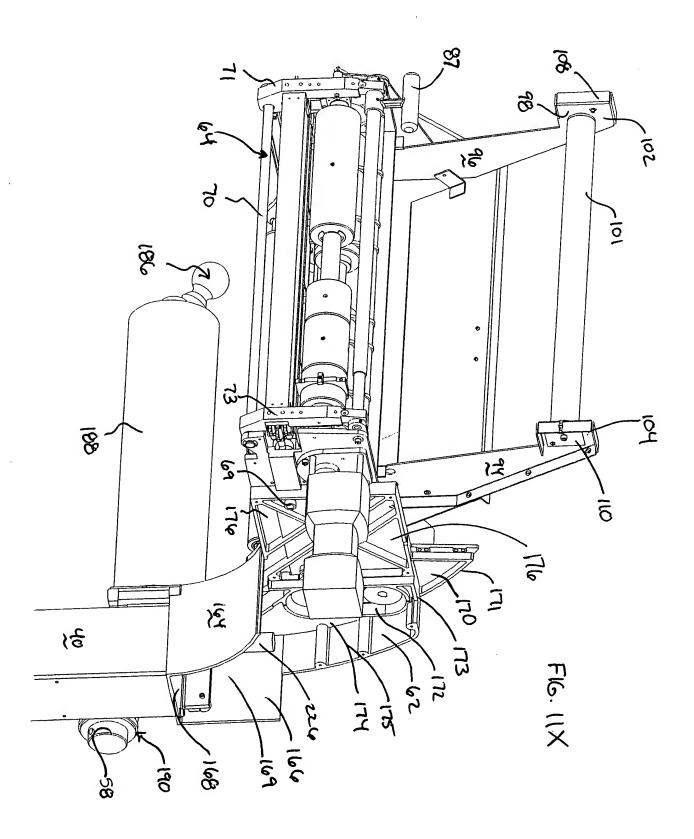
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U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
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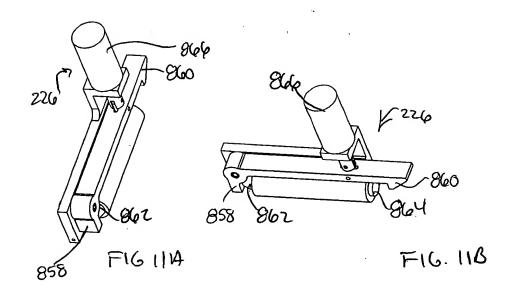


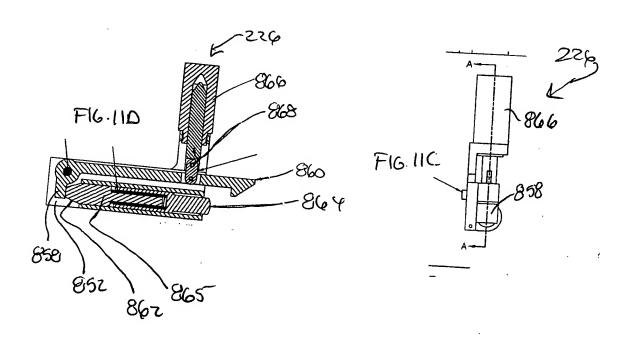
Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

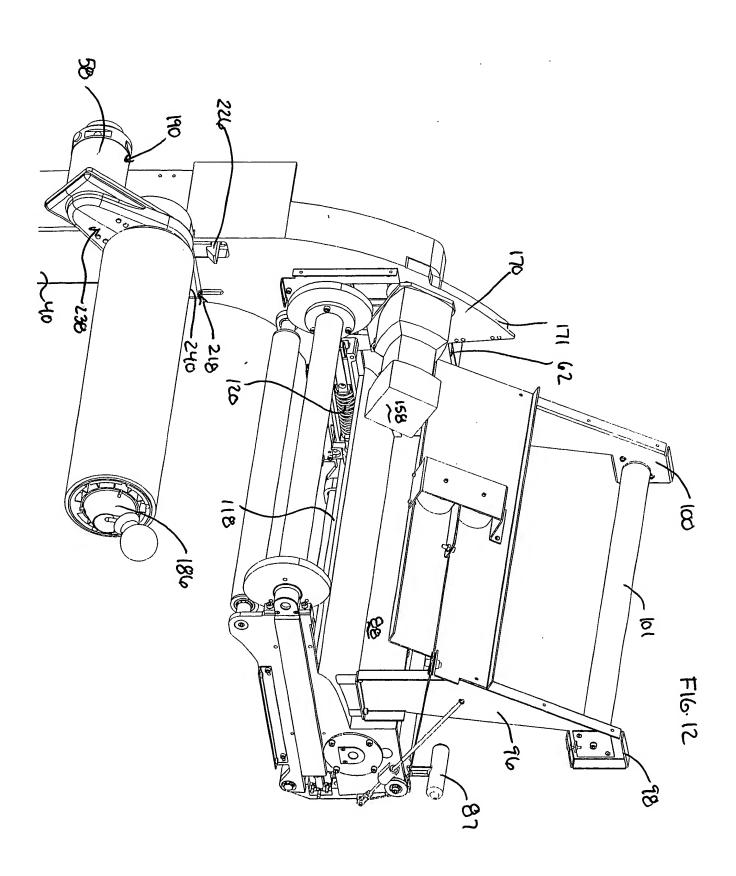


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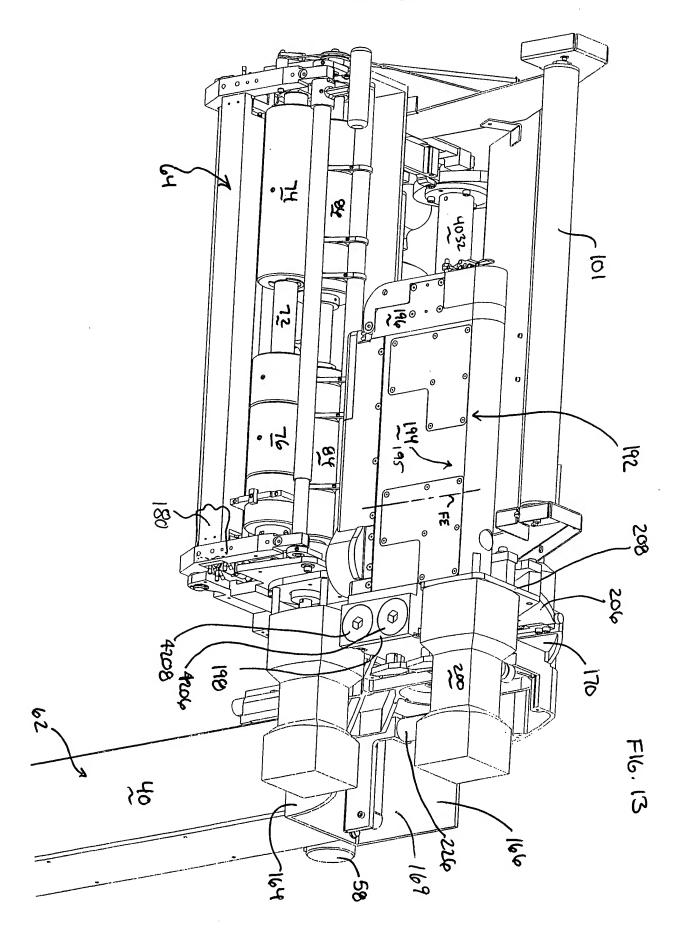


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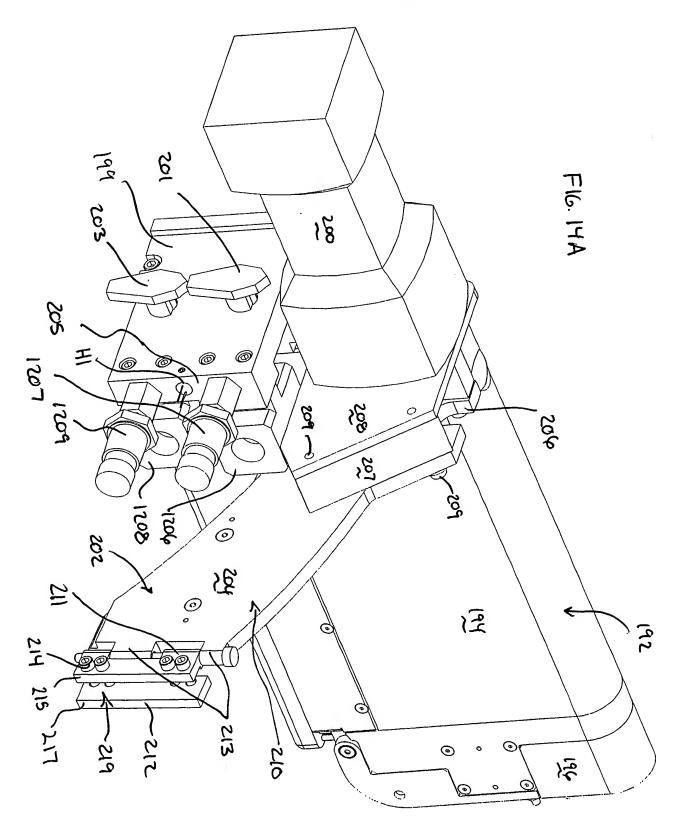
Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



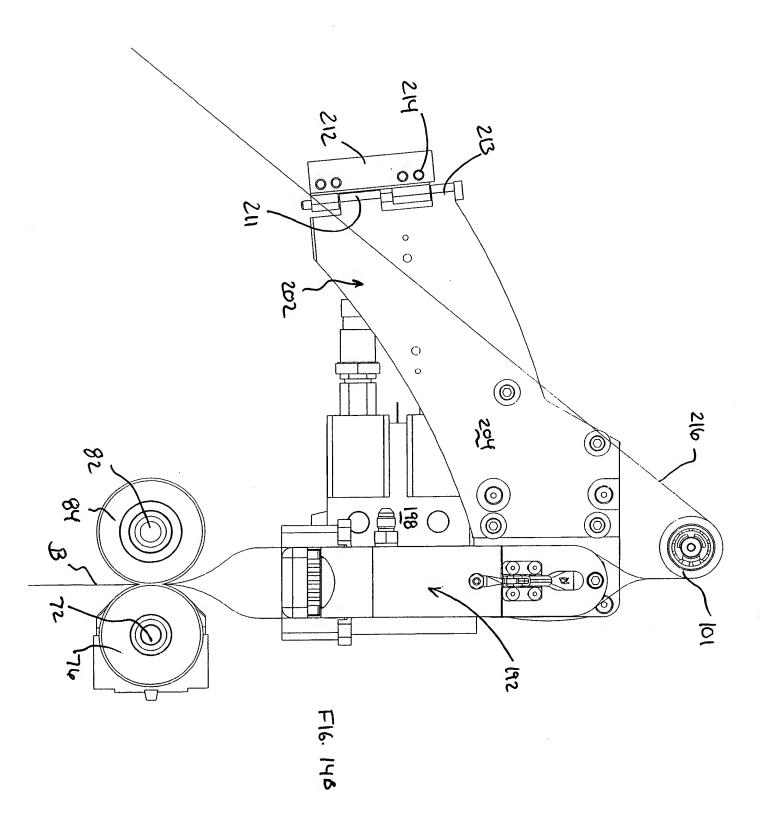
Inventor: George BERTRAM

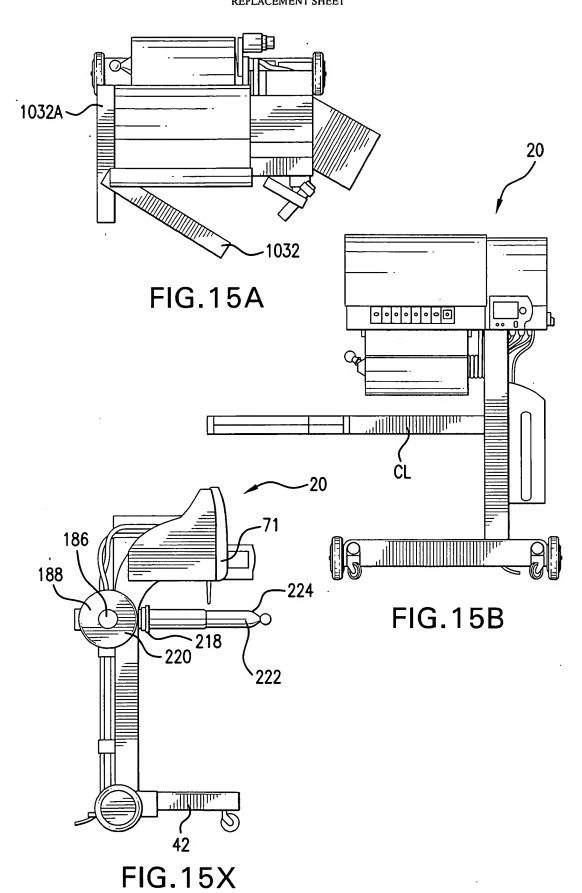
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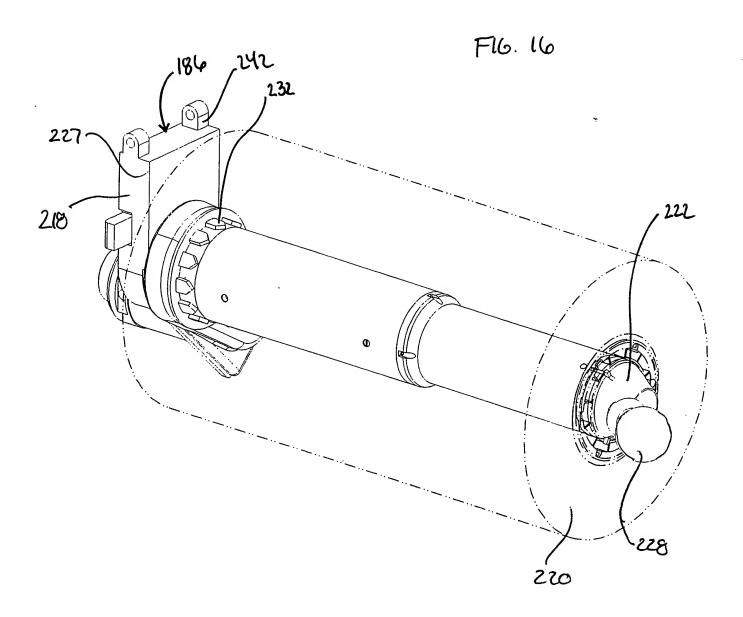
Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

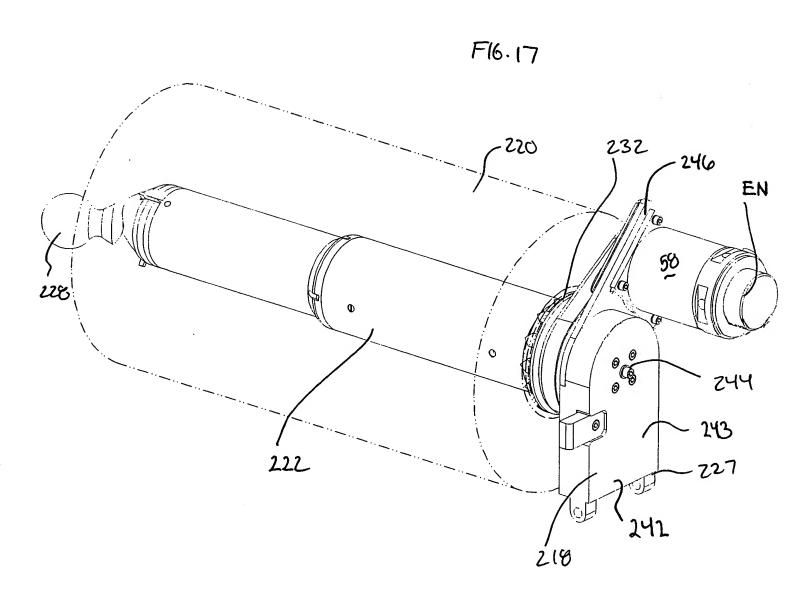




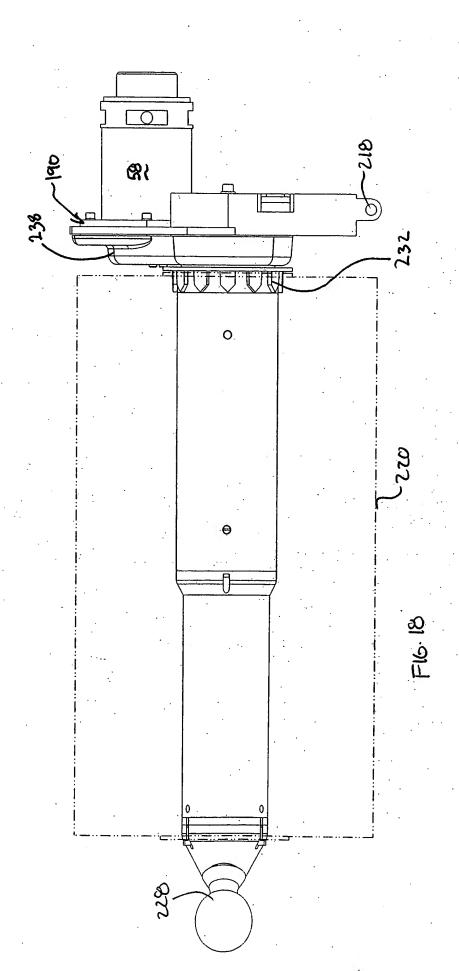
U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM



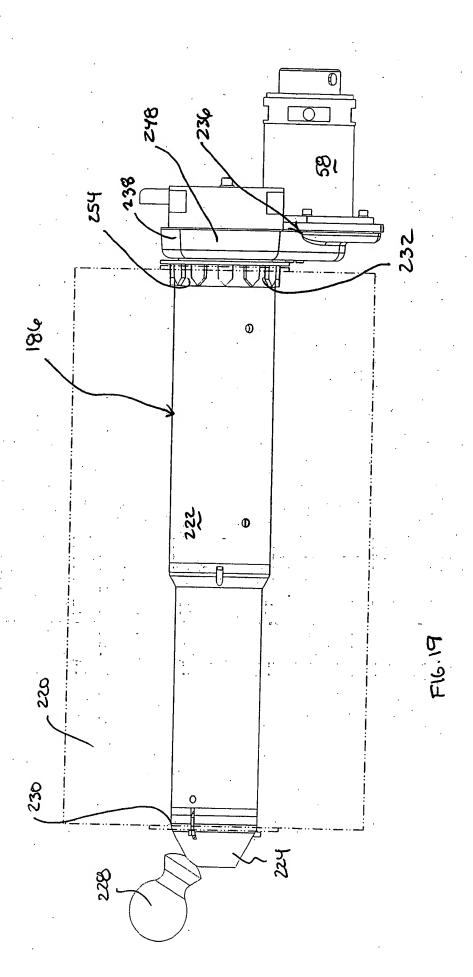
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U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
REPLACEMENT SHEET

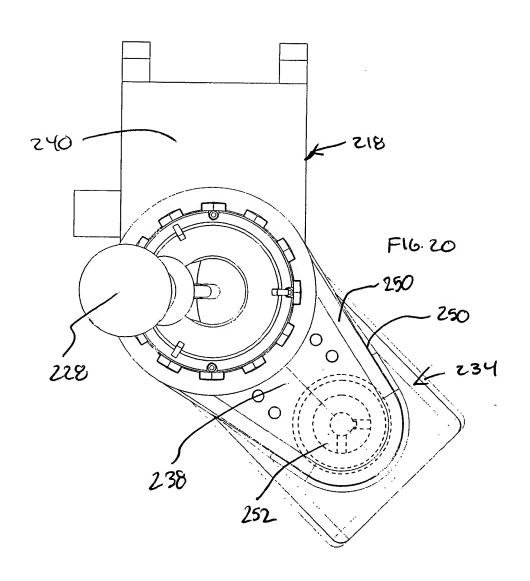


U.S. Patent Application Serial No. 10/798,897
Inventor: George BERTRAM
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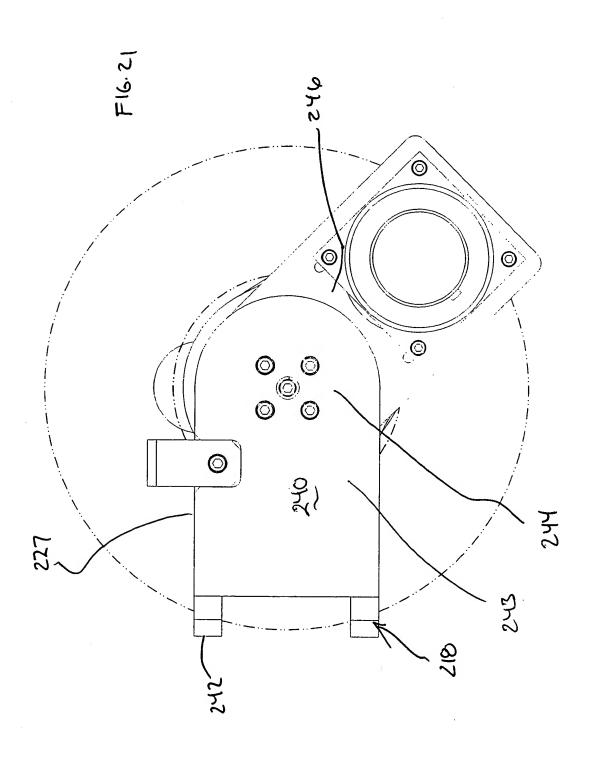


Inventor: George BERTRAM

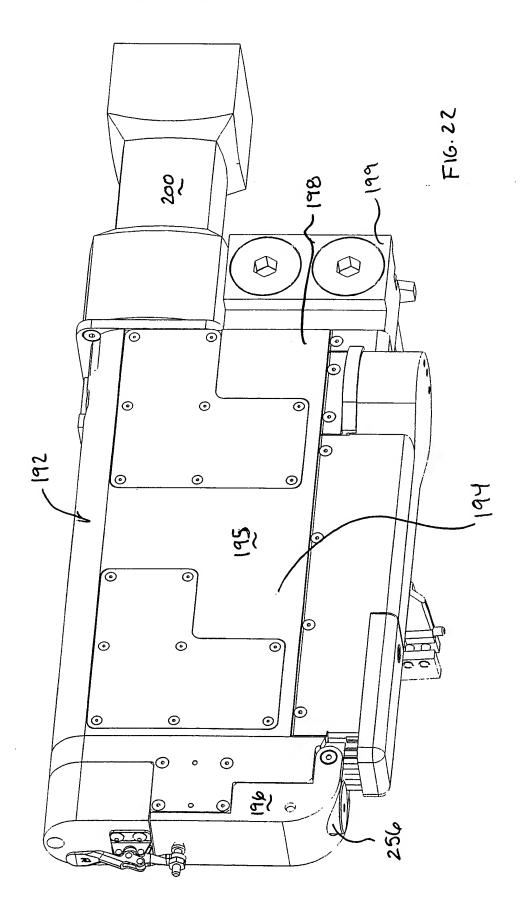
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Inventor: George BERTRAM
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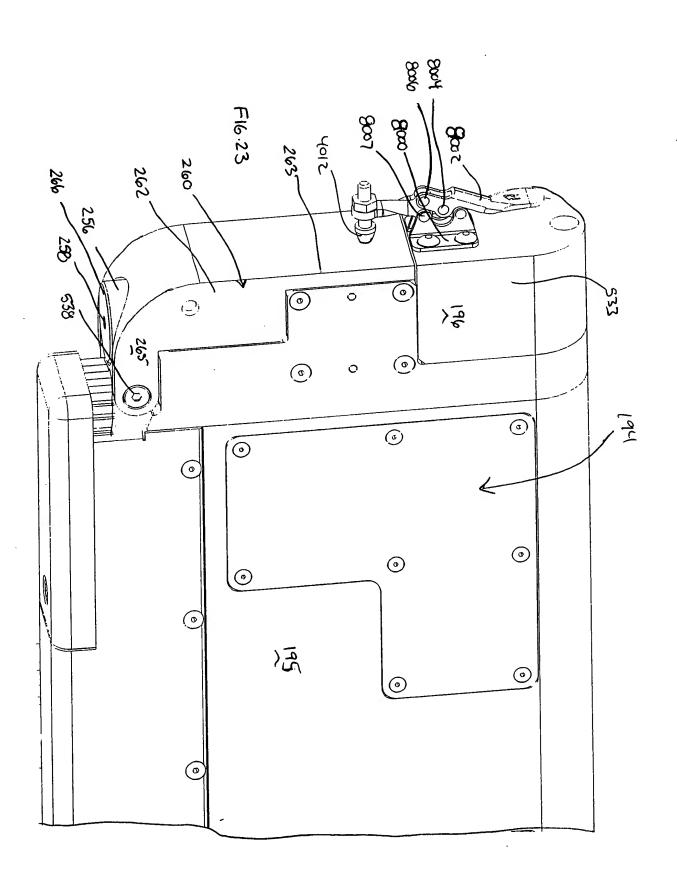


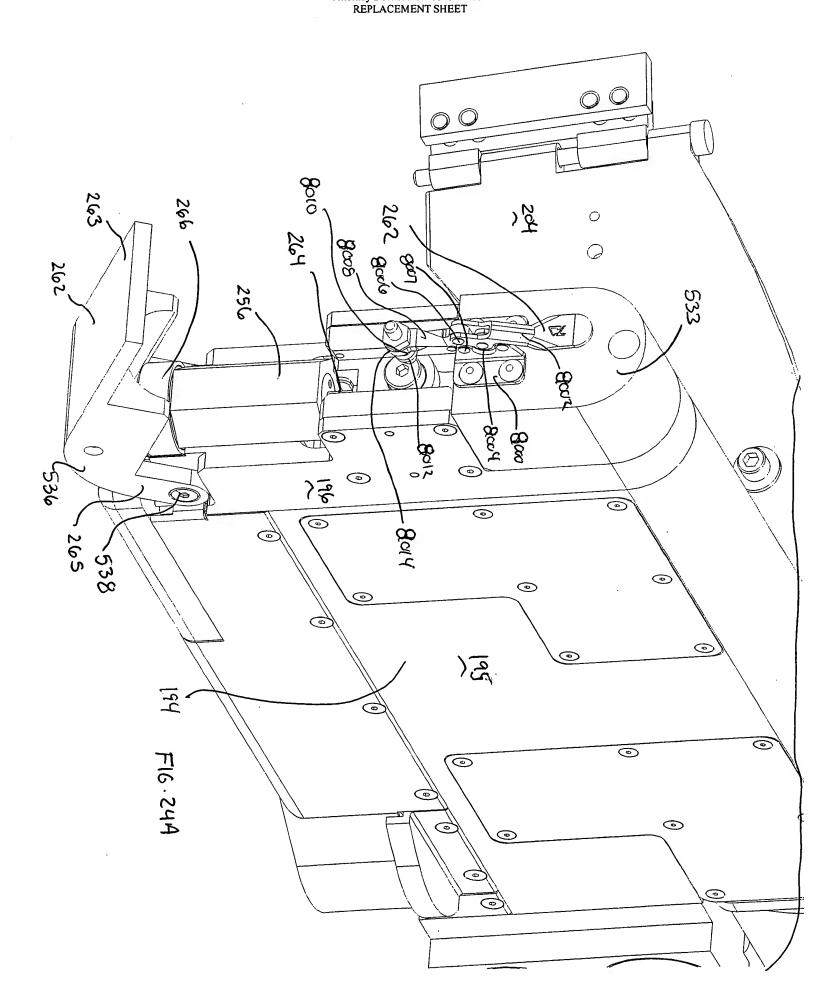
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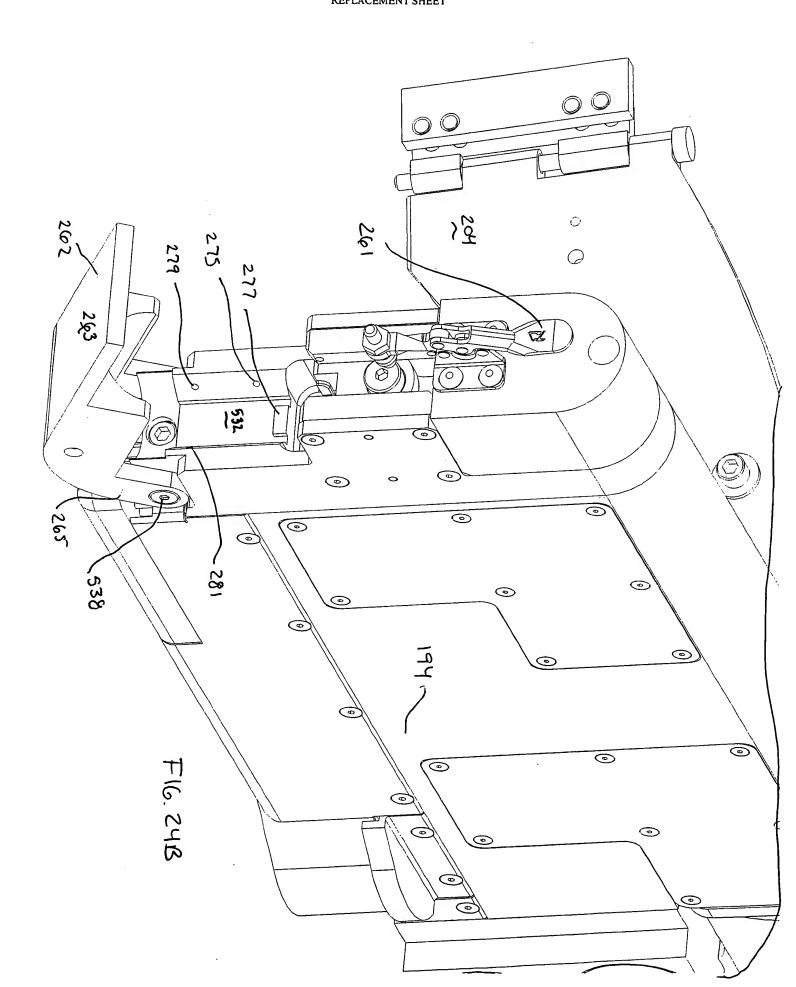


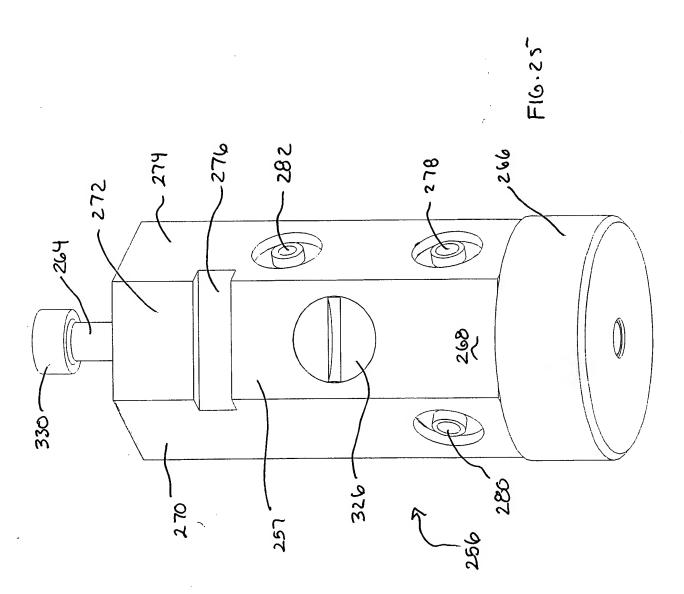
Inventor: George BERTRAM

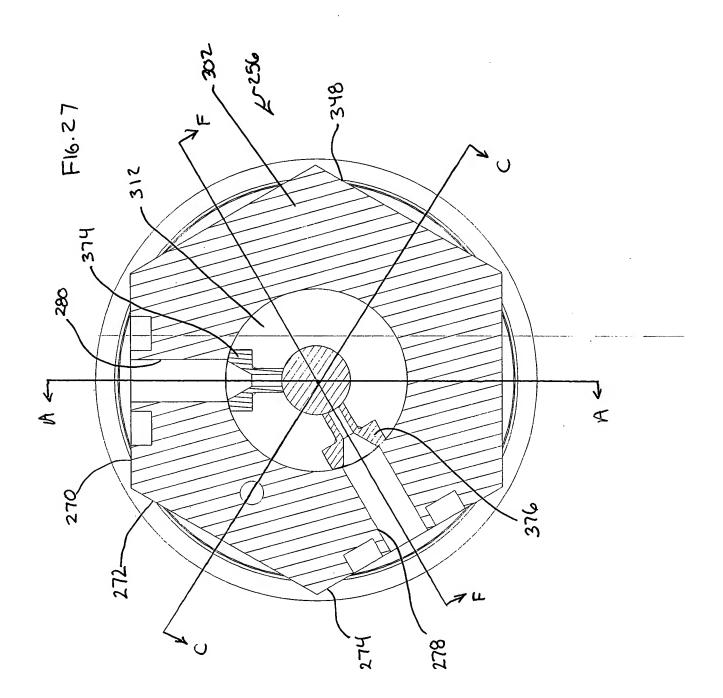
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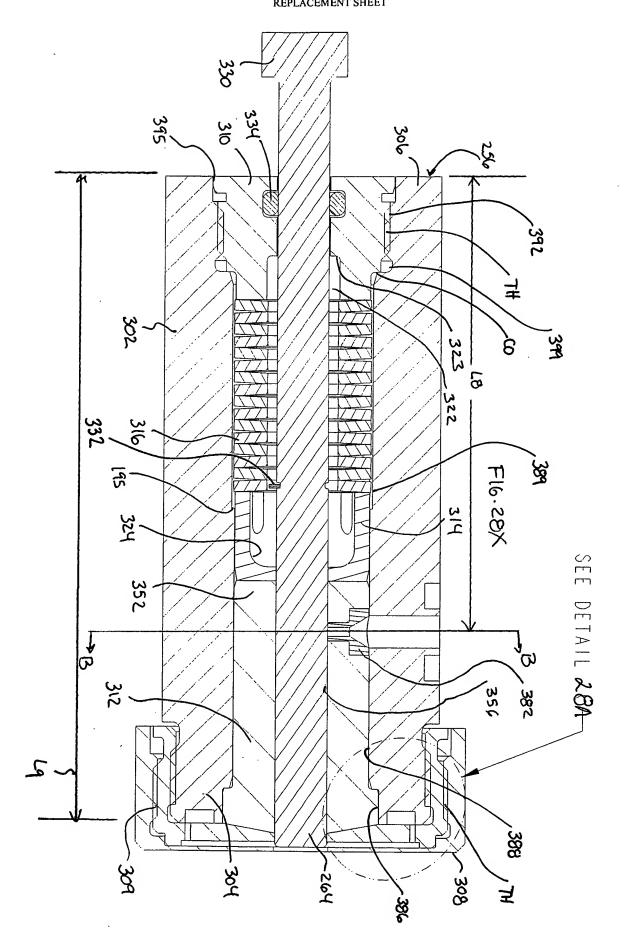


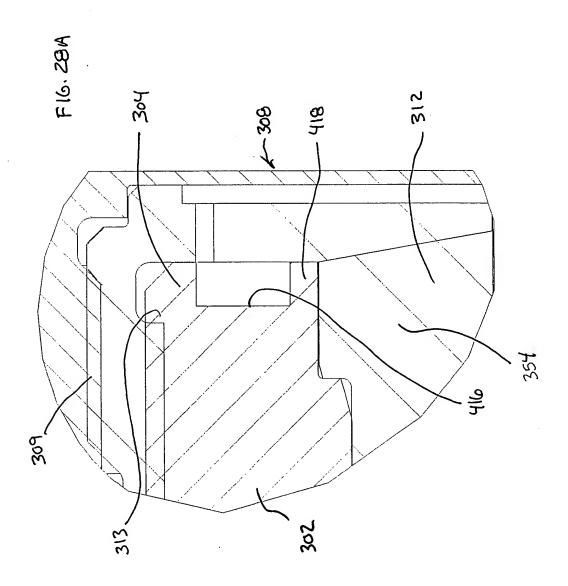


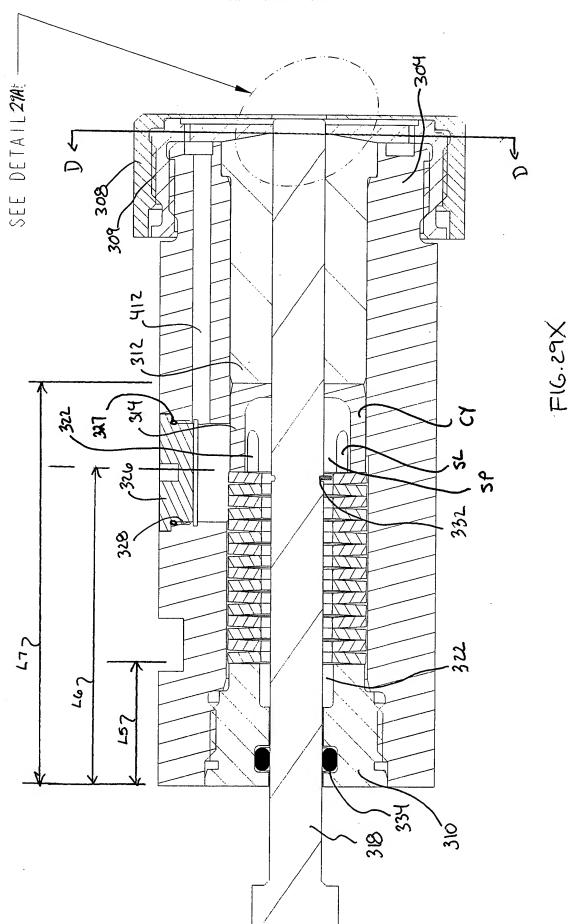


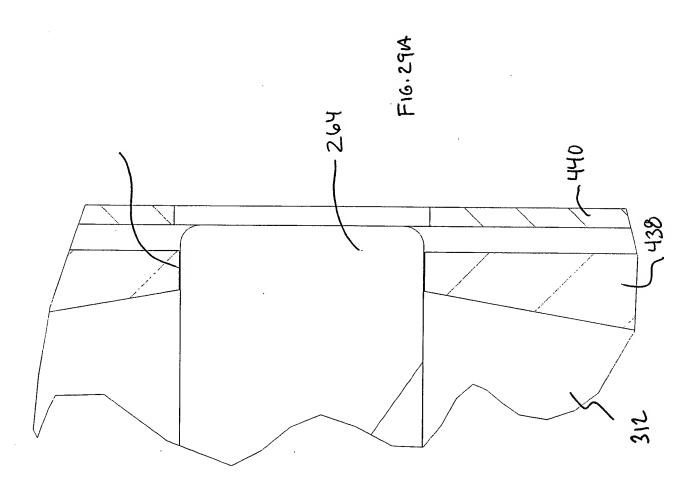


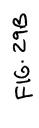


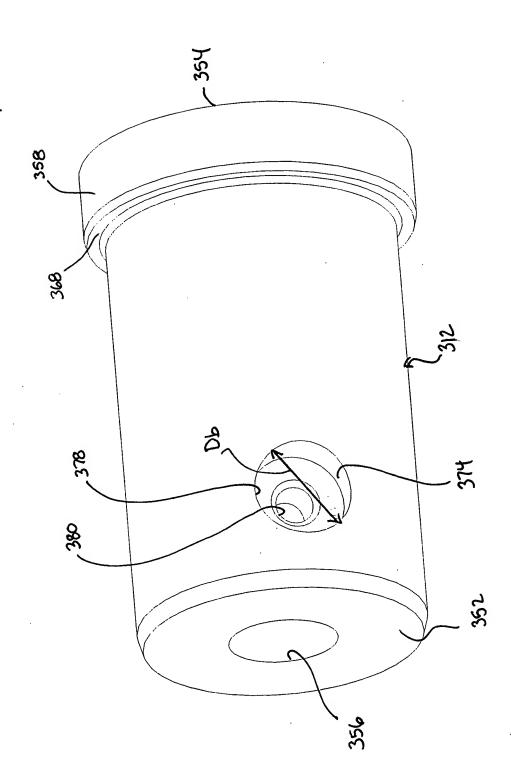


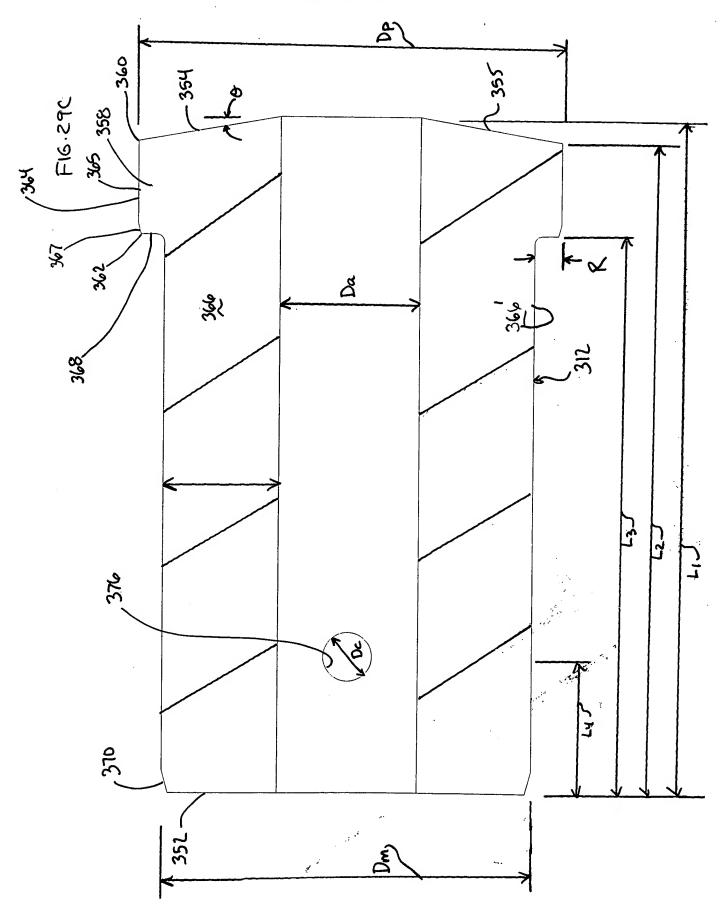


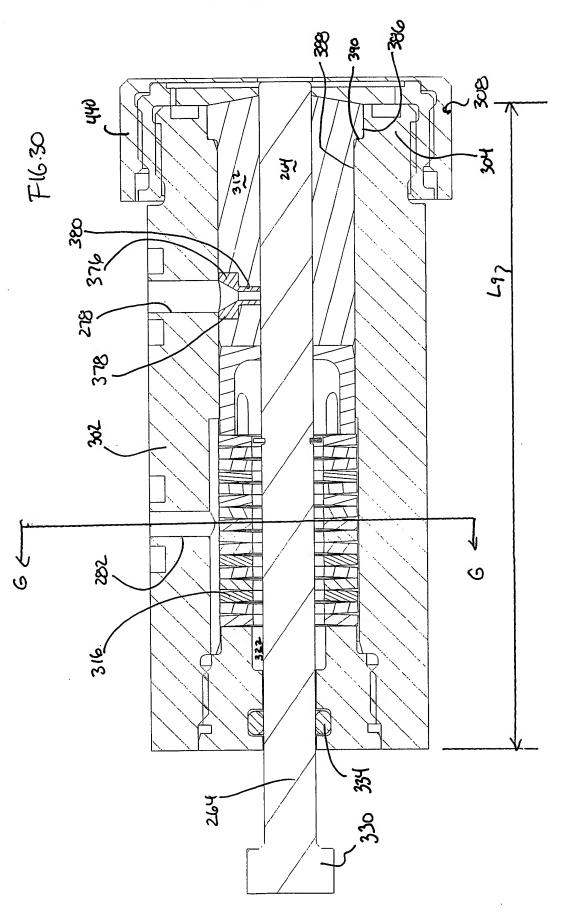


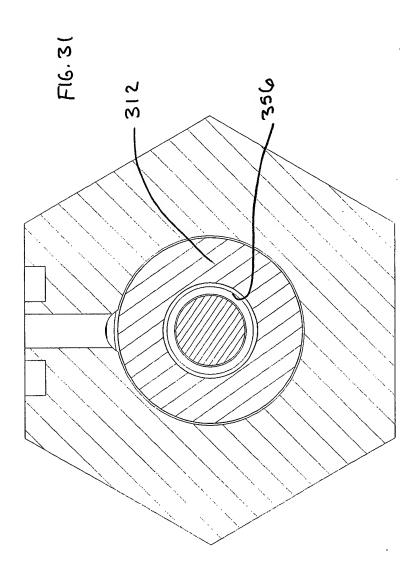


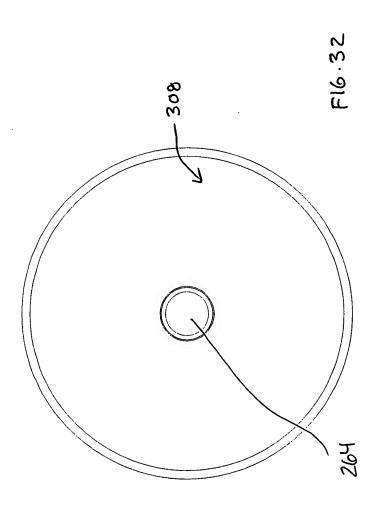




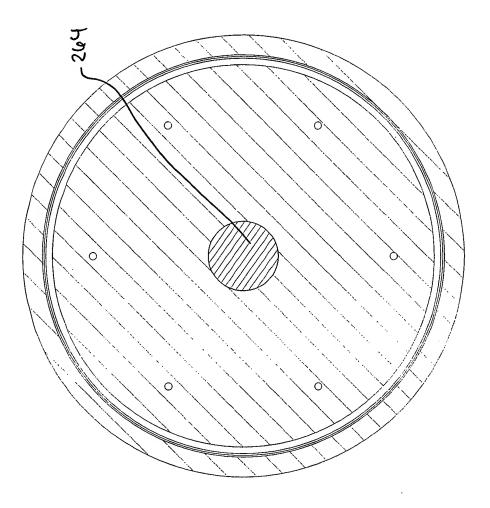


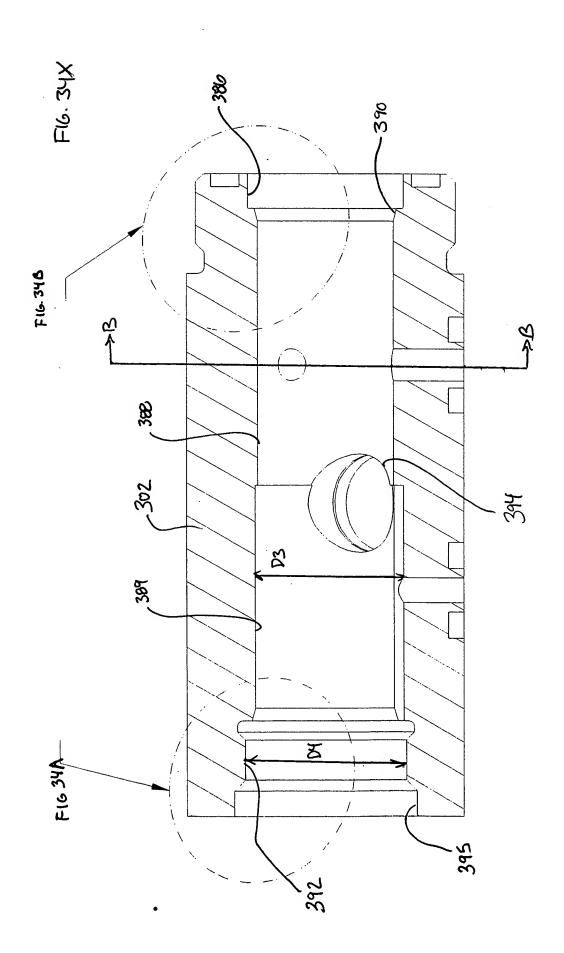


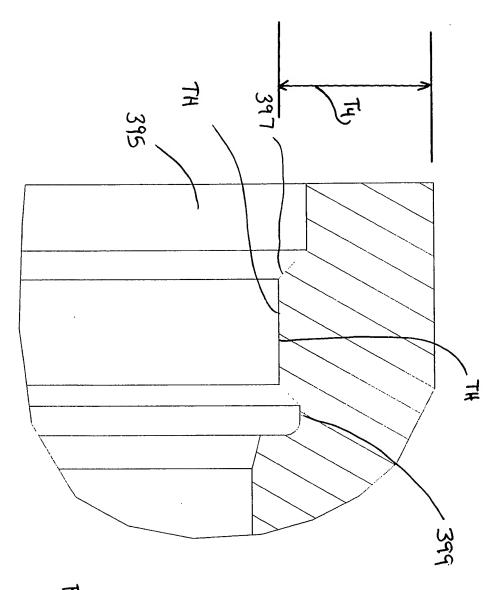


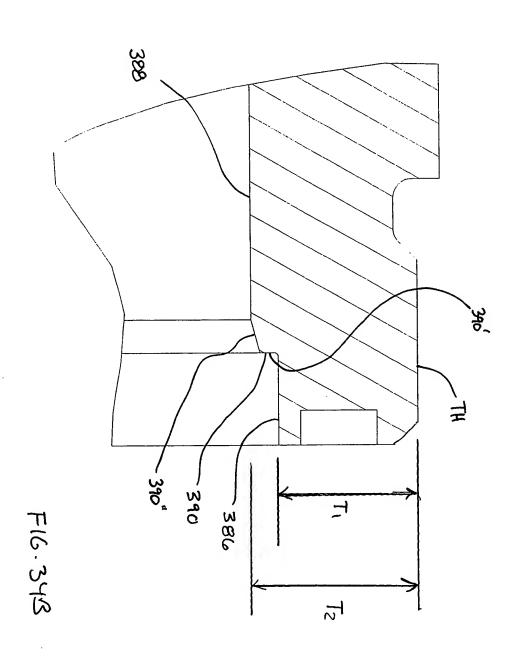


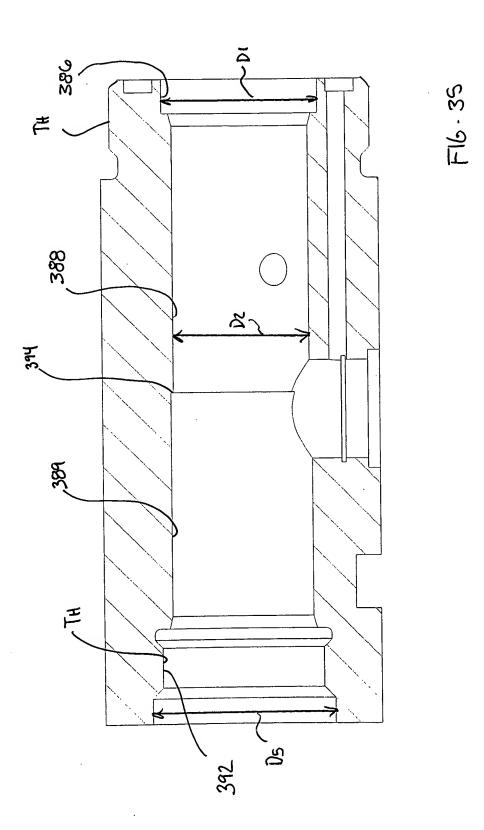
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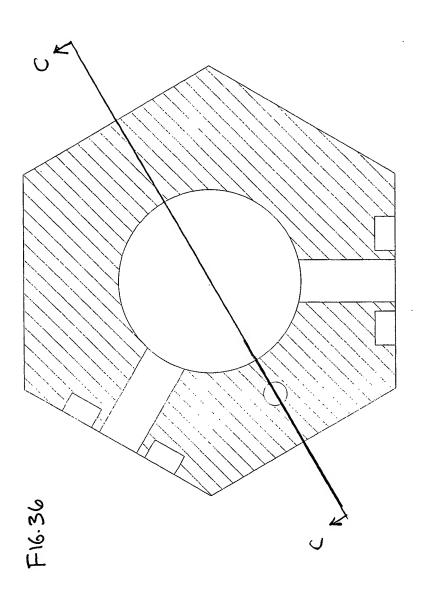


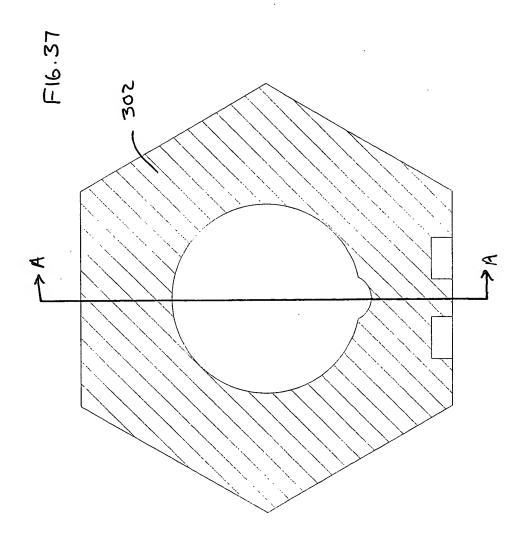




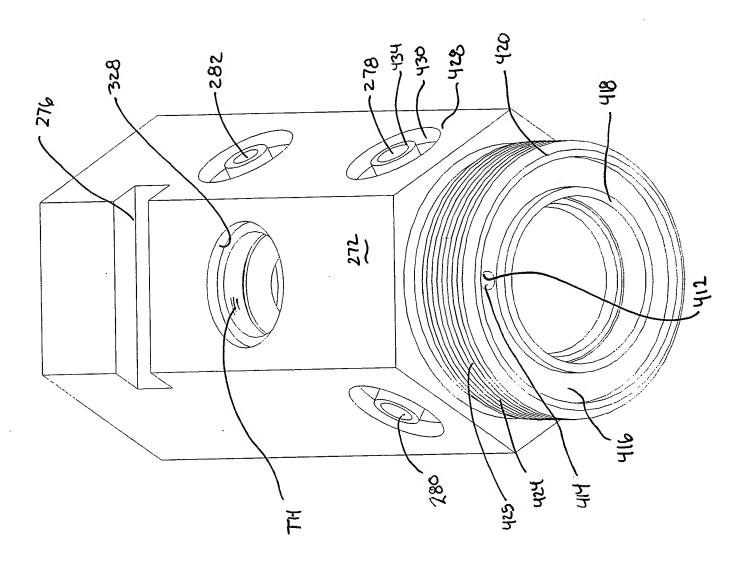


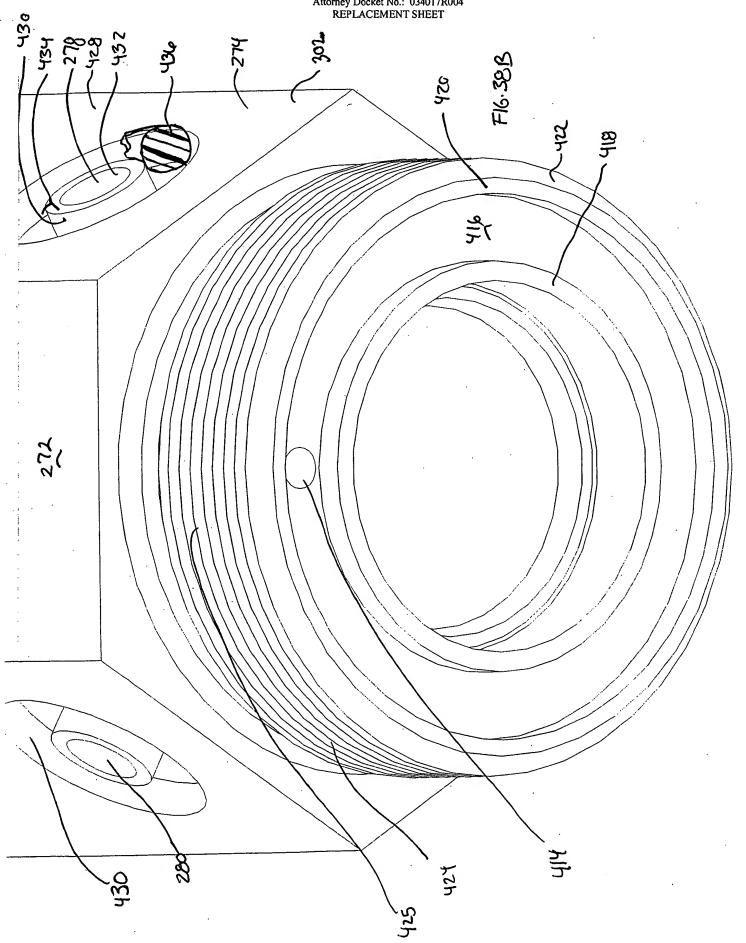


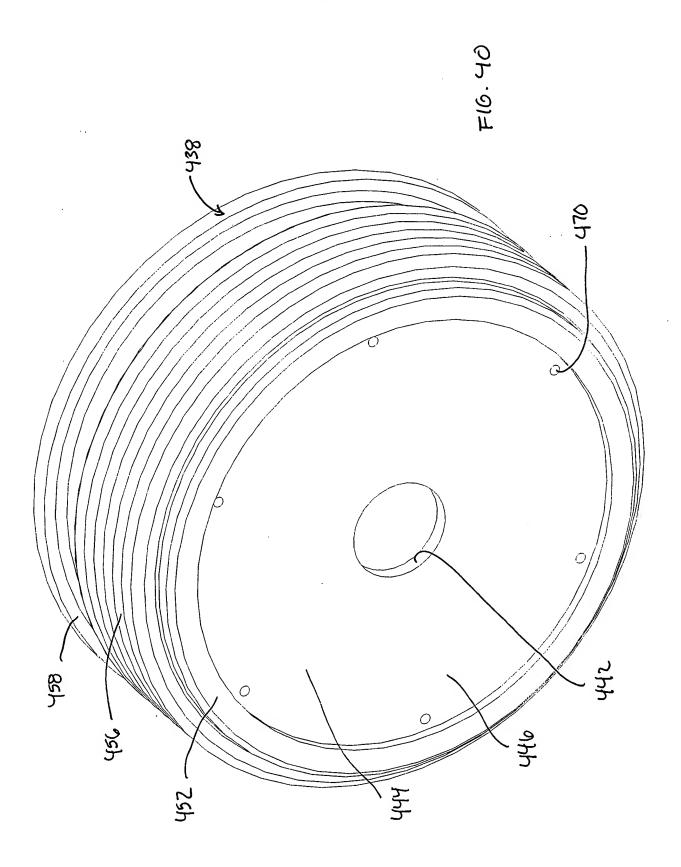


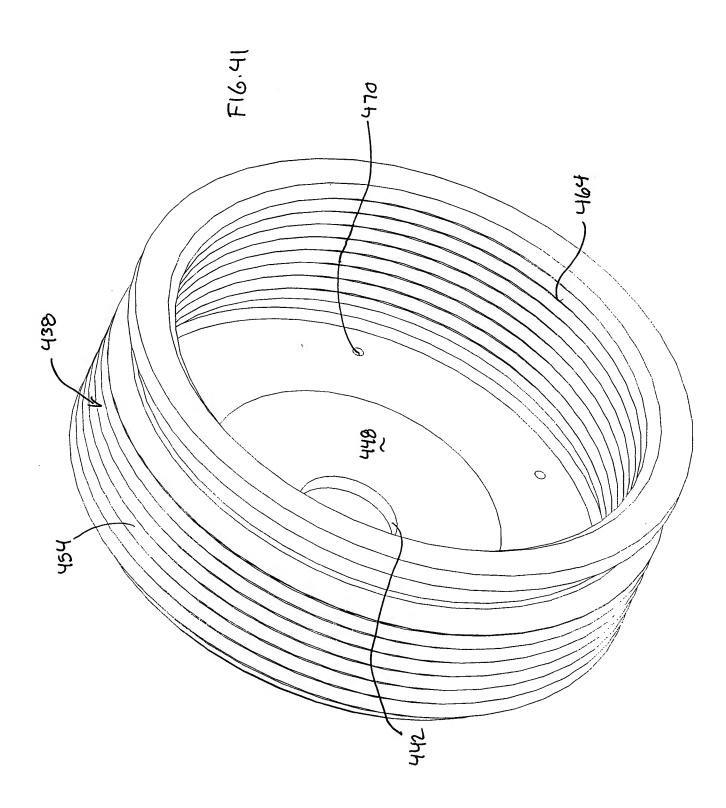


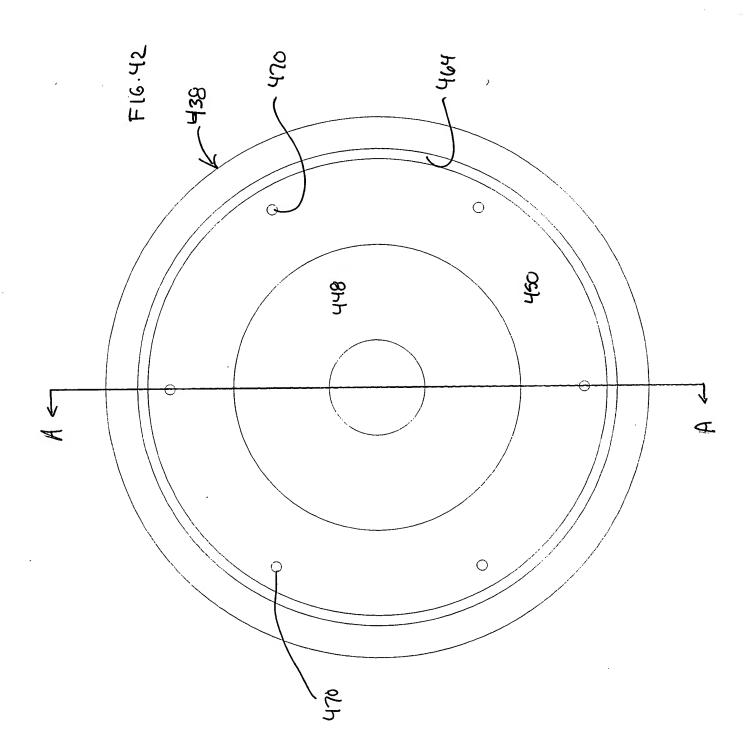
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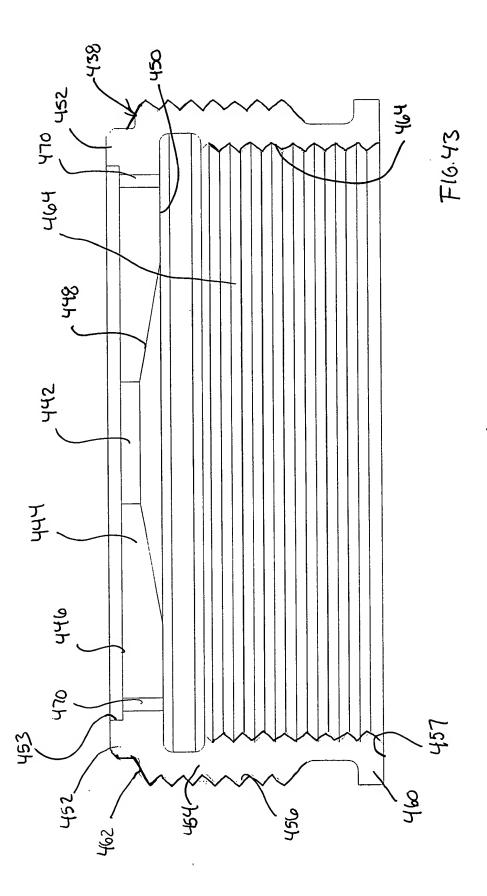


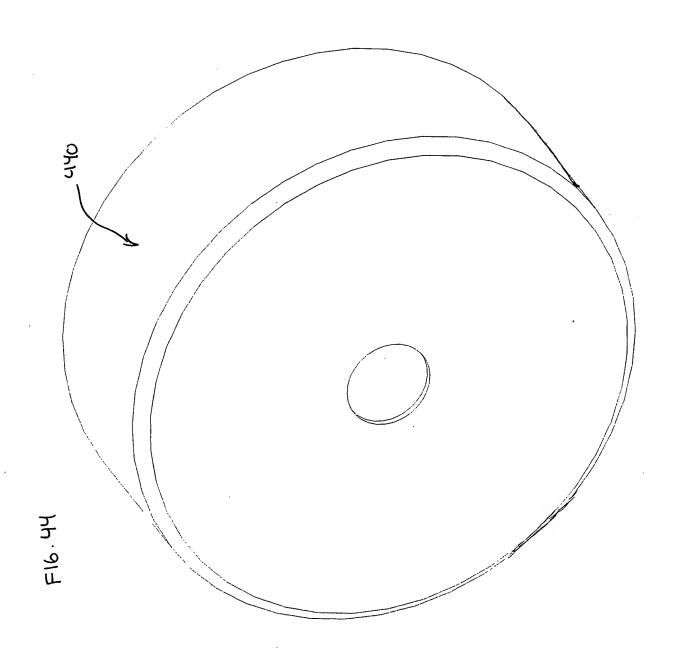


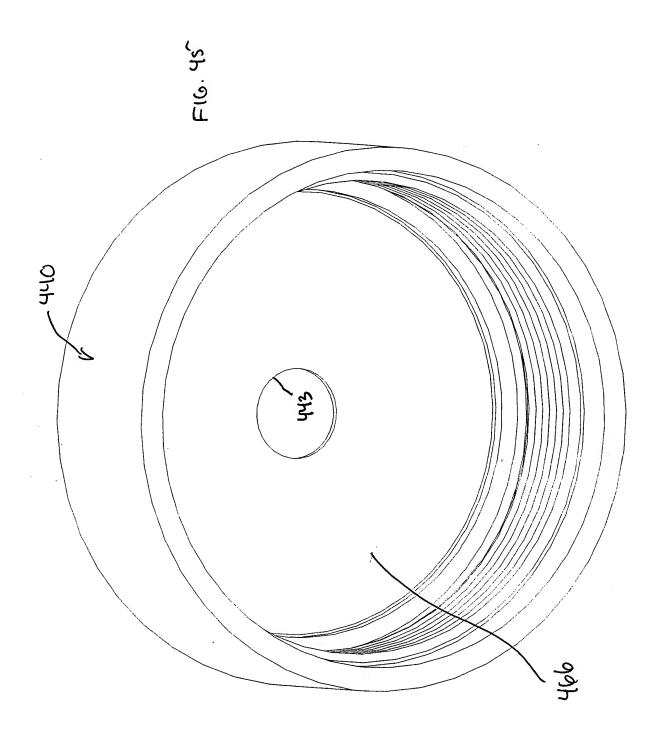


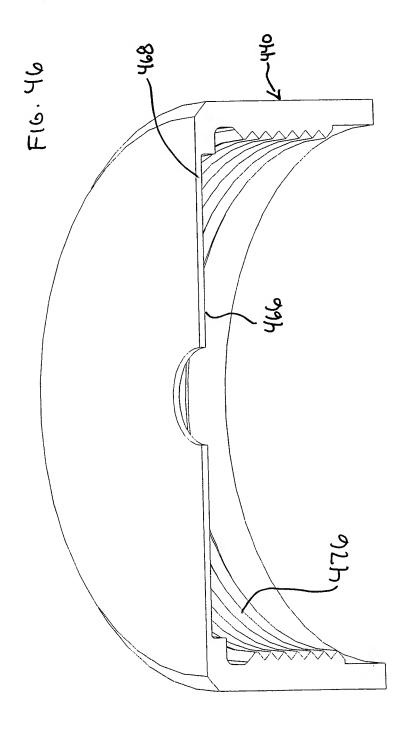


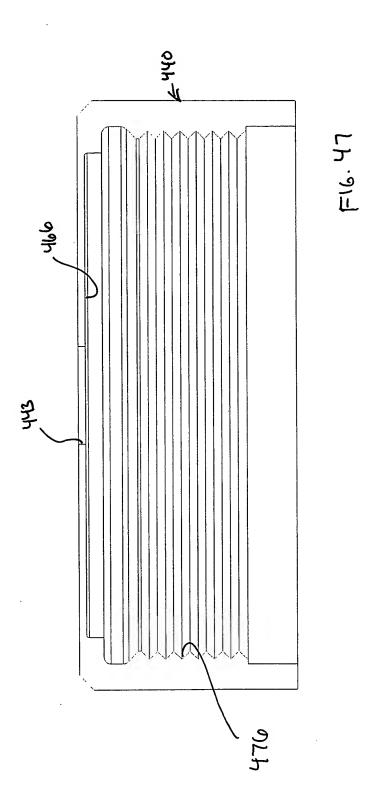


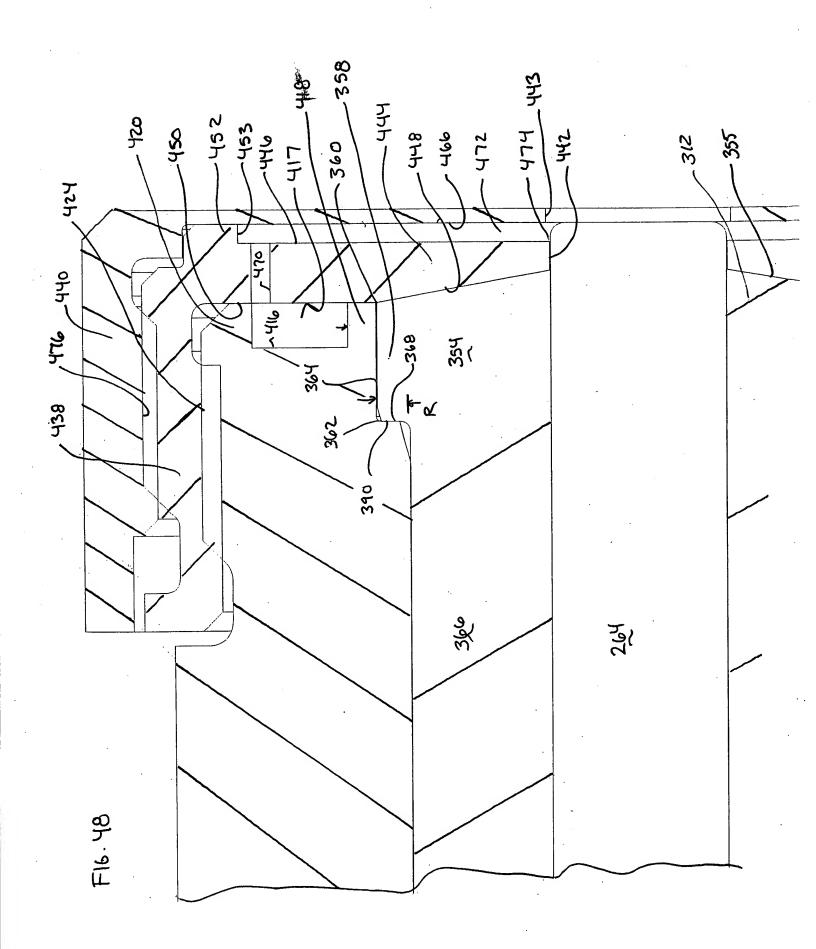








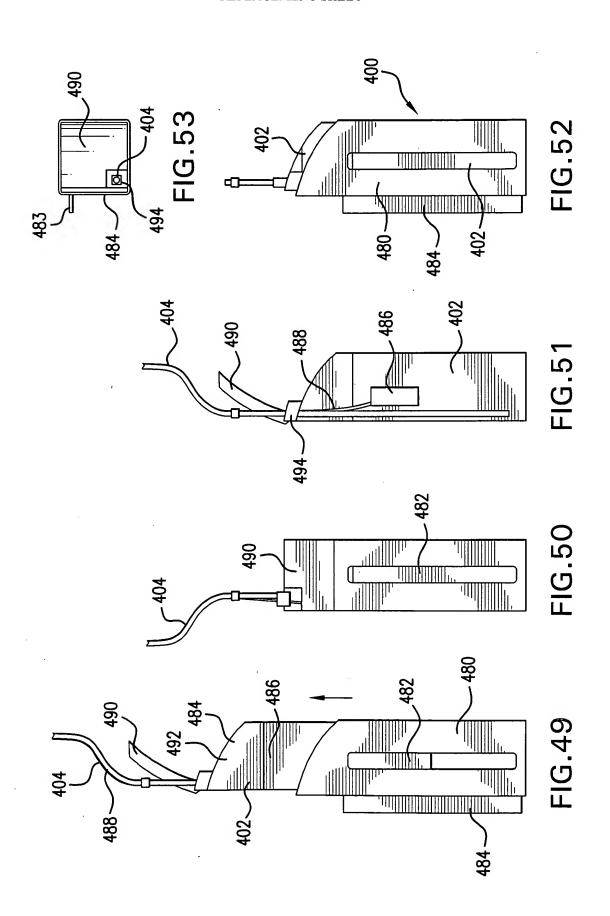




U.S. Patent Application Serial No. 10/798,897

Inventor: George BERTRAM
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Attorney Docket No.: 034017R004 REPLACEMENT SHEET



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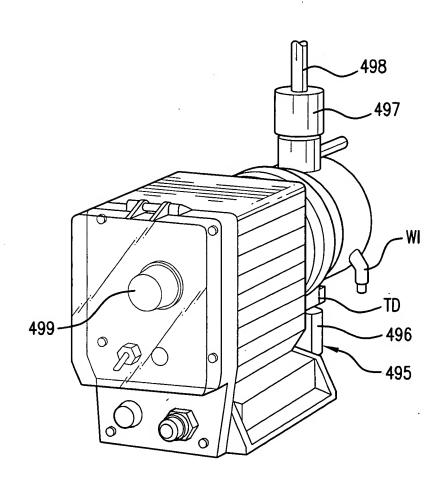
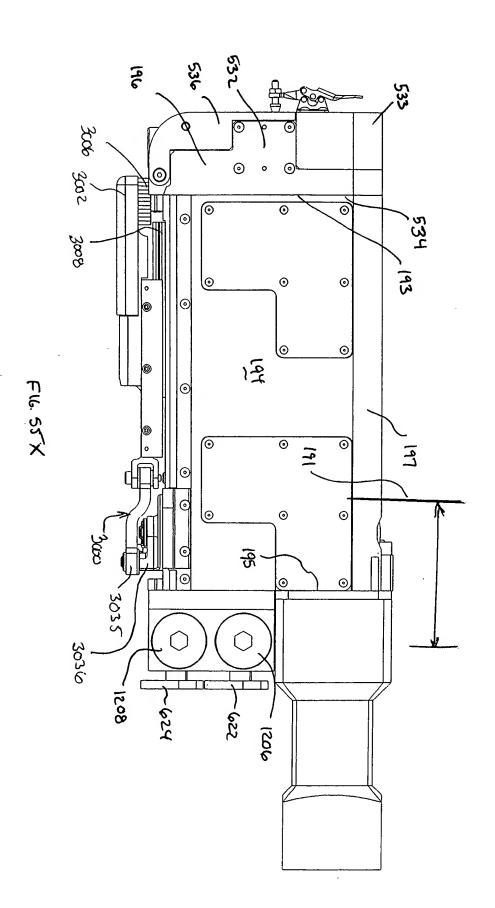
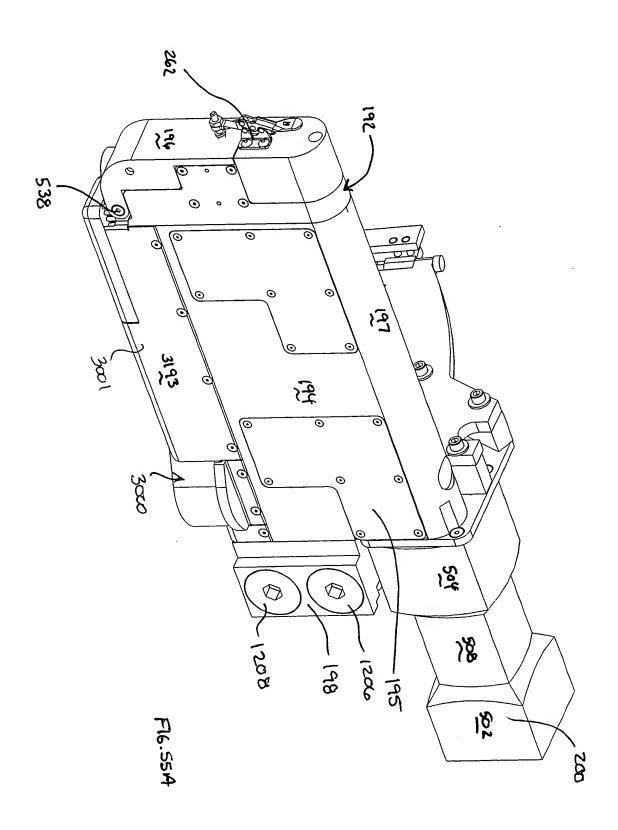
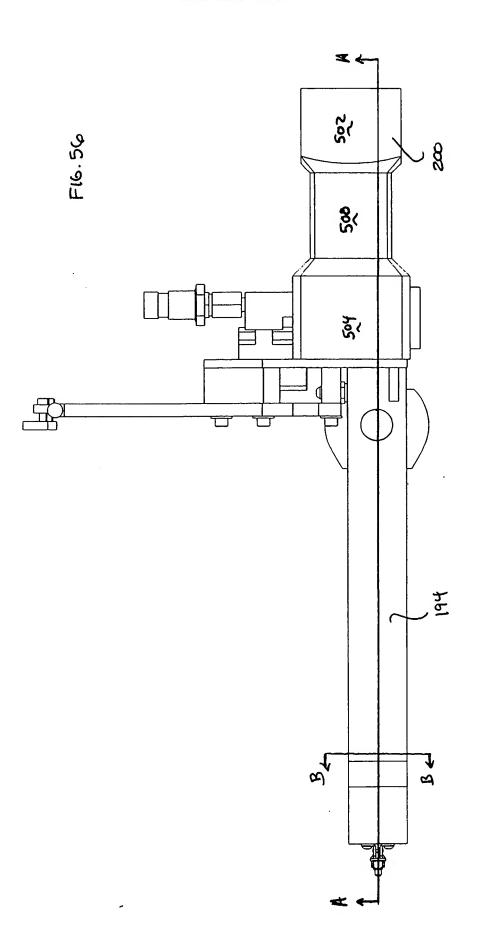
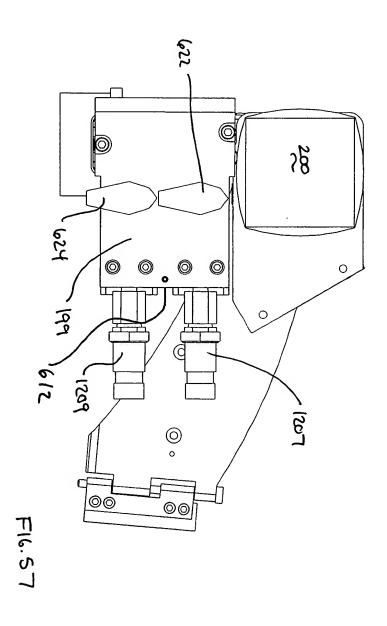


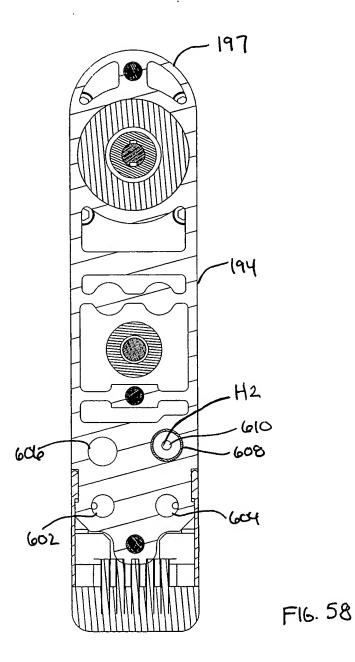
FIG.54

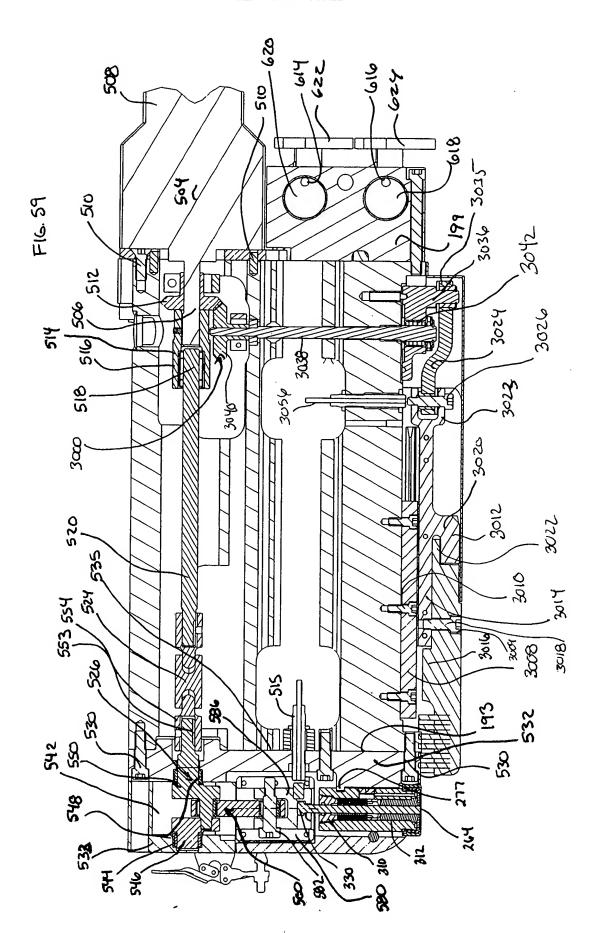


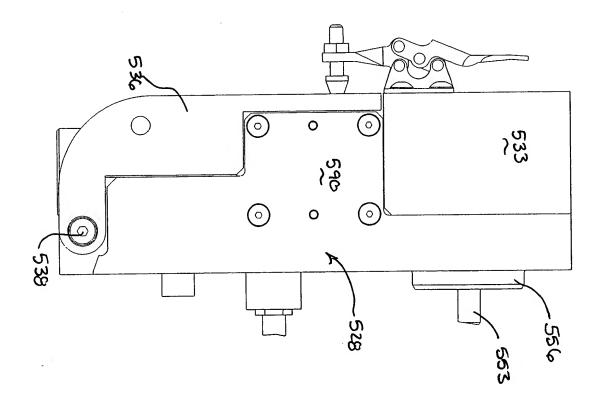


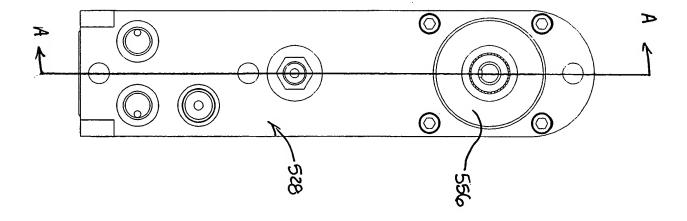


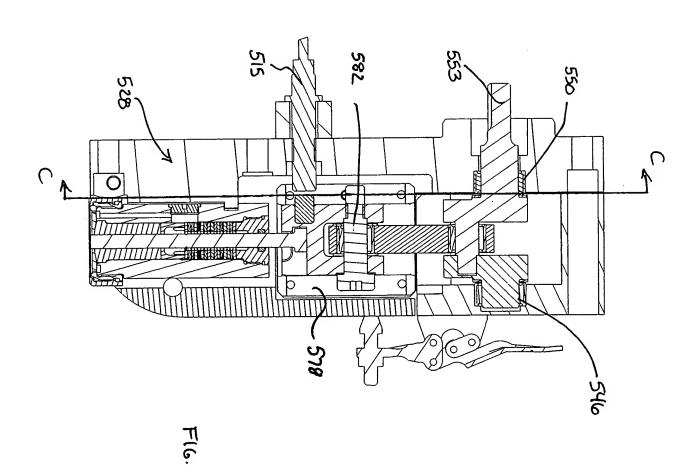


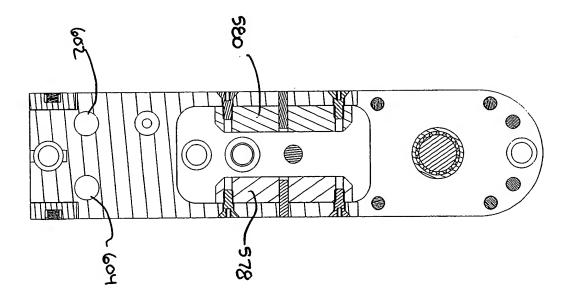


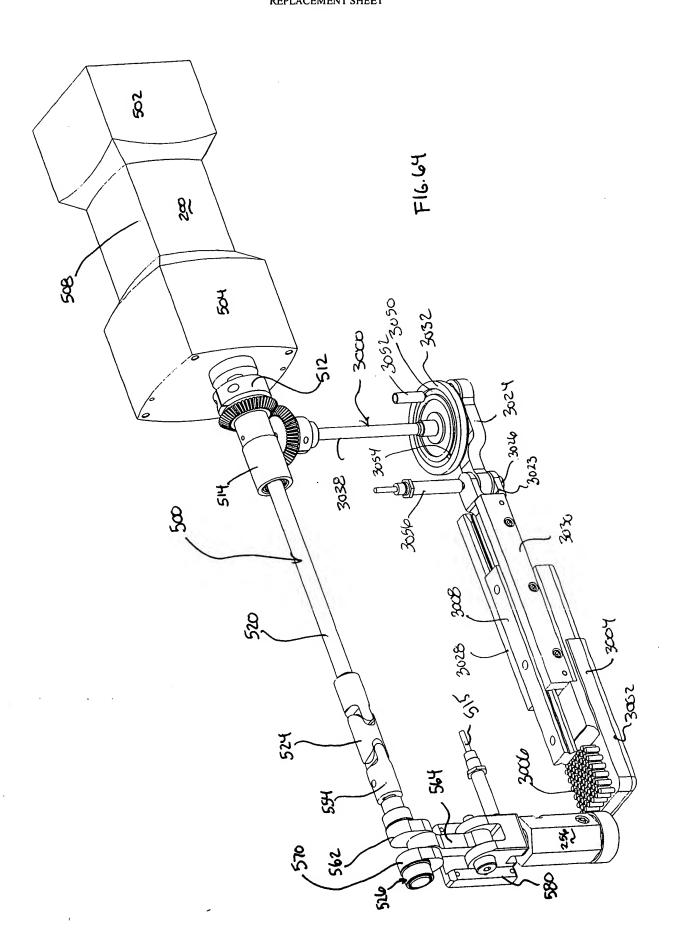


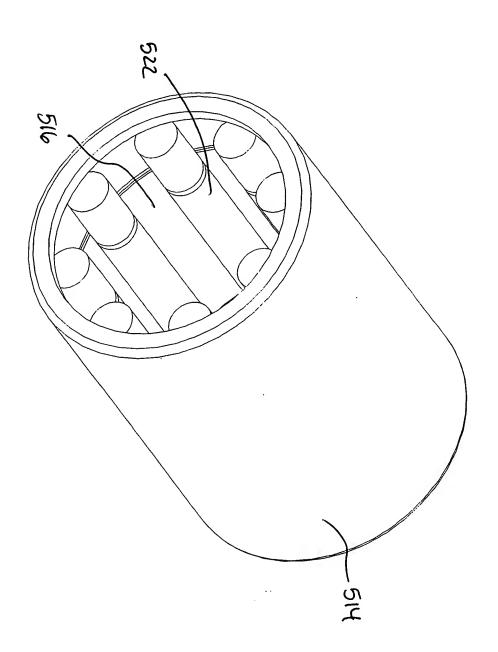


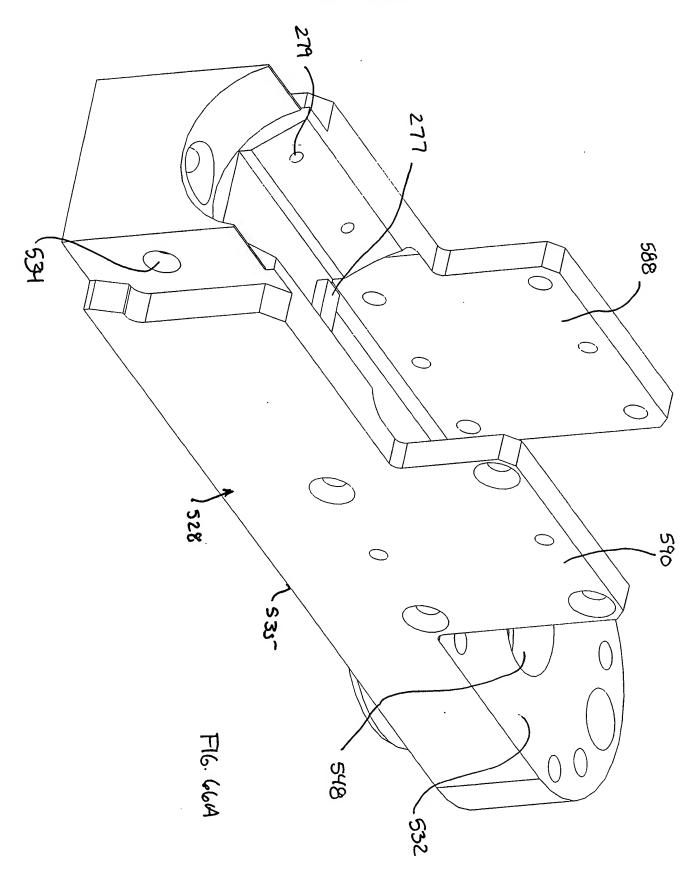


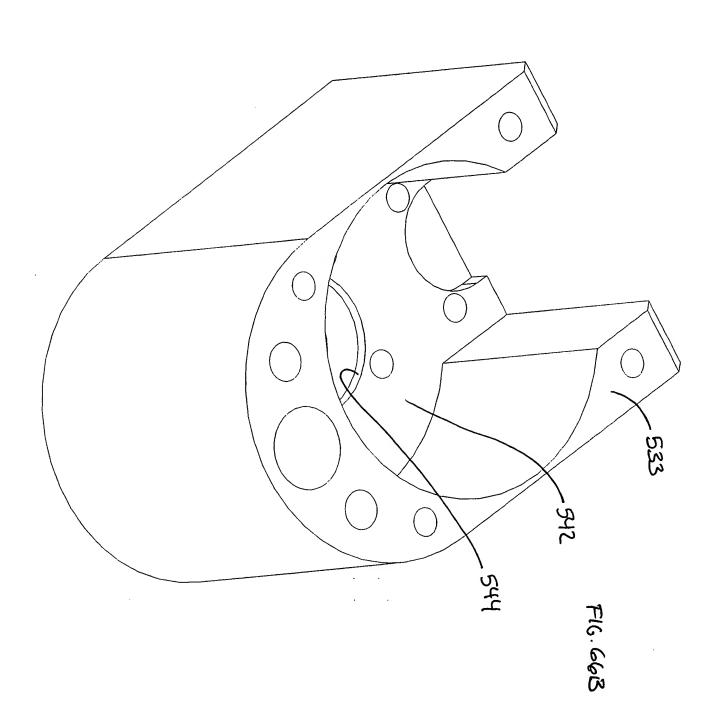


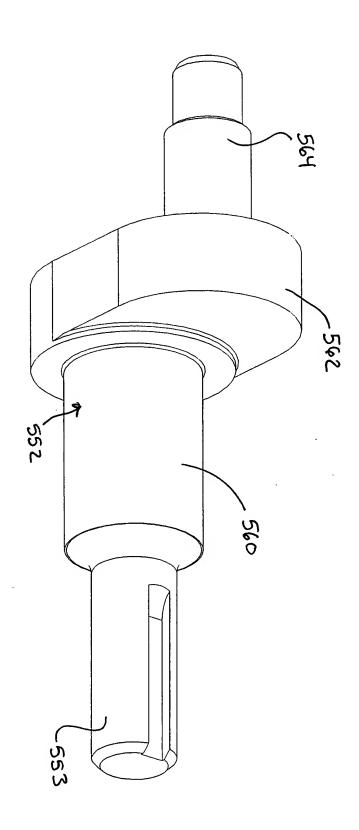


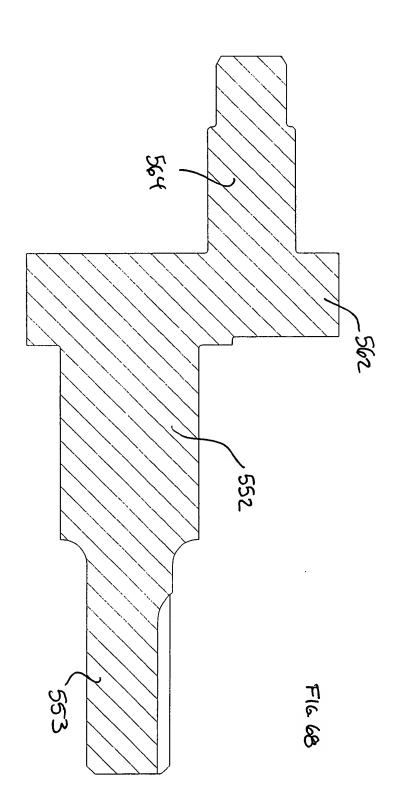


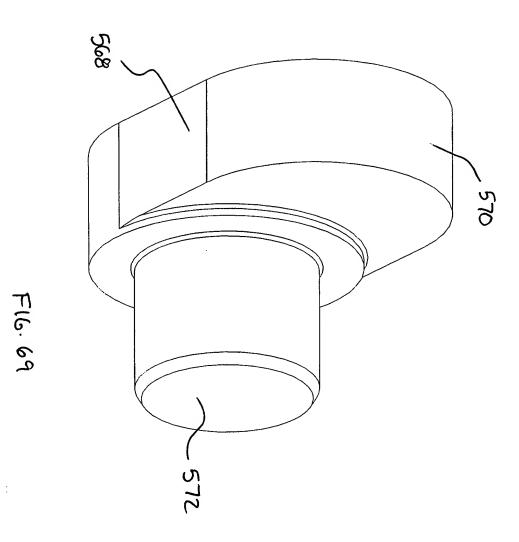


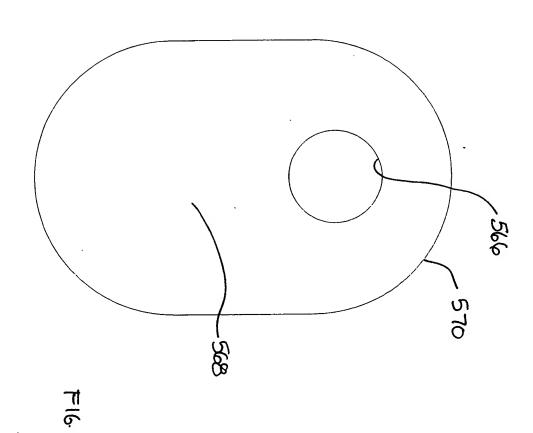


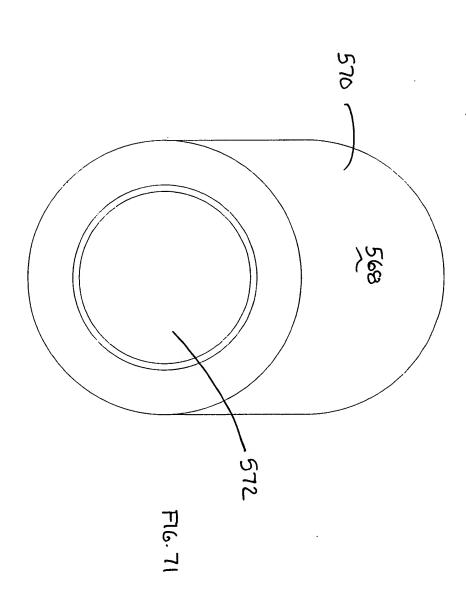


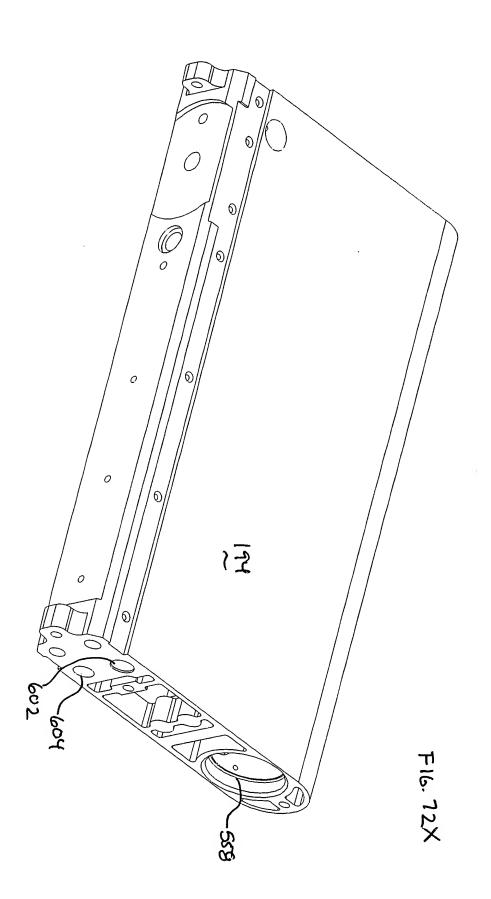


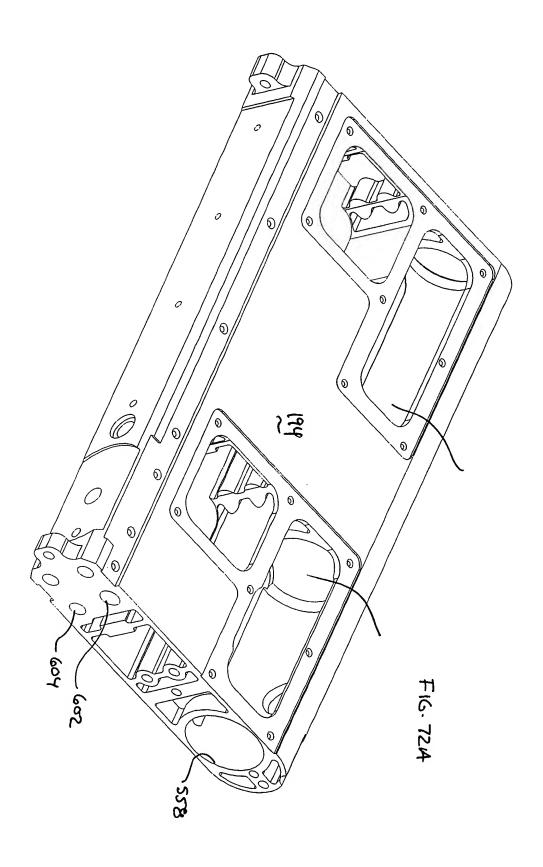


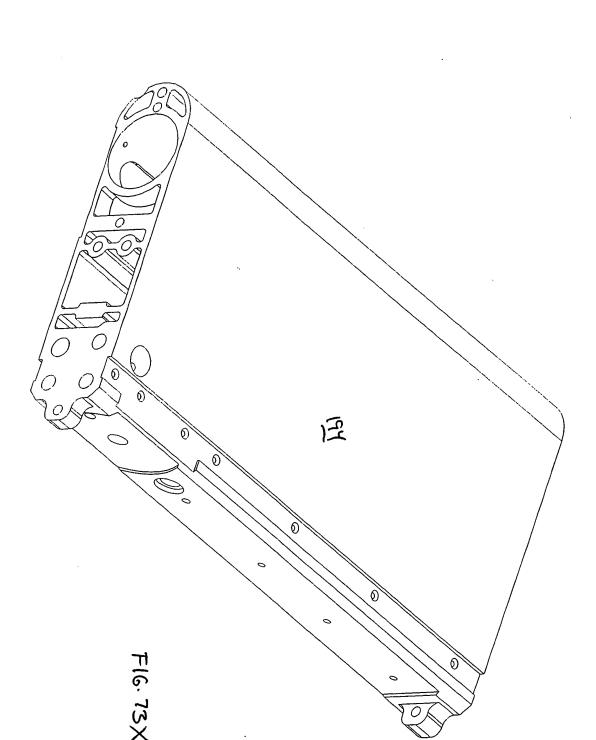


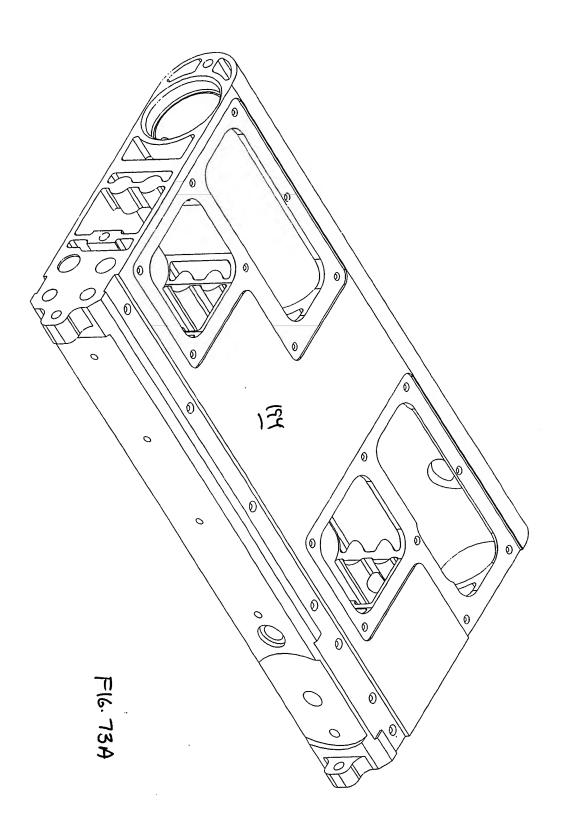


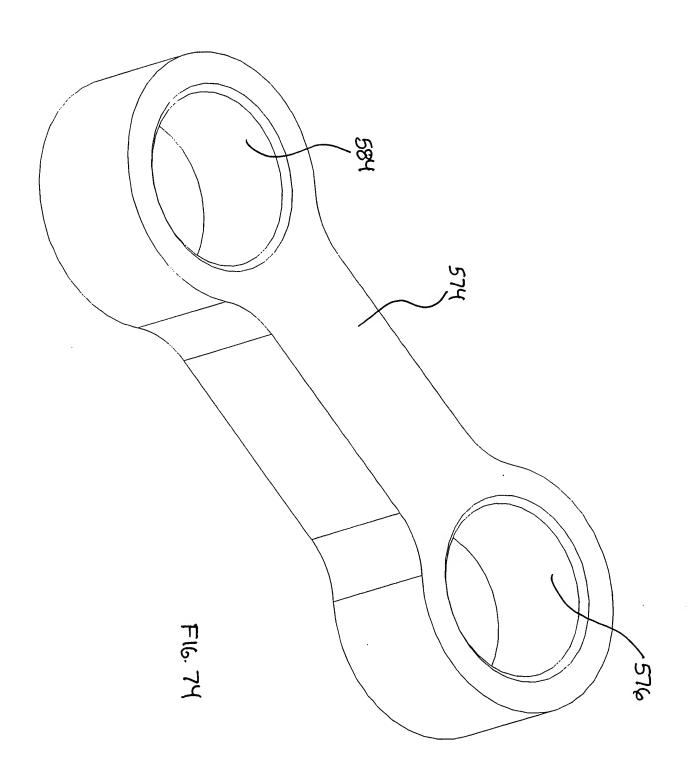


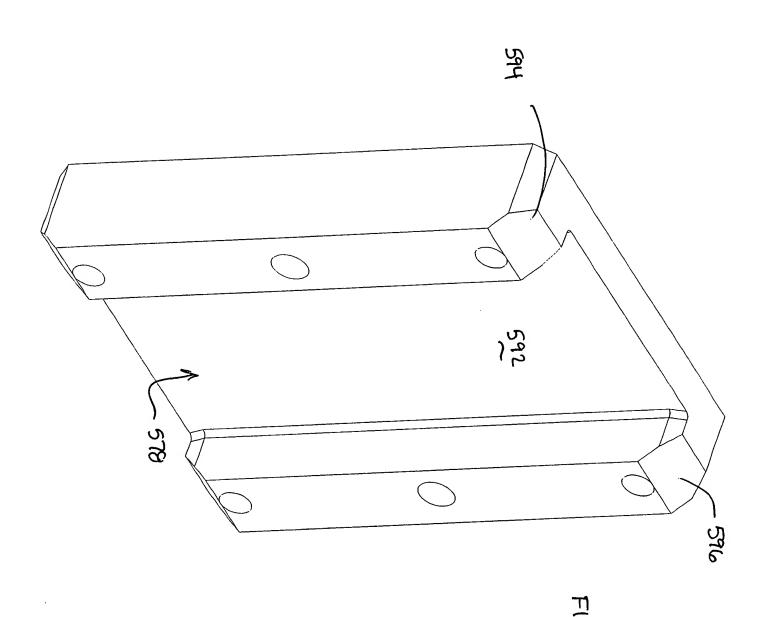


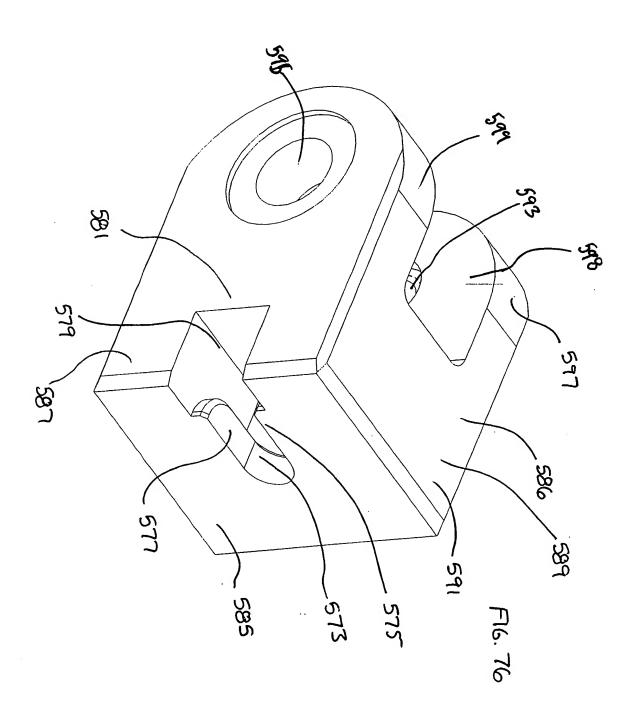


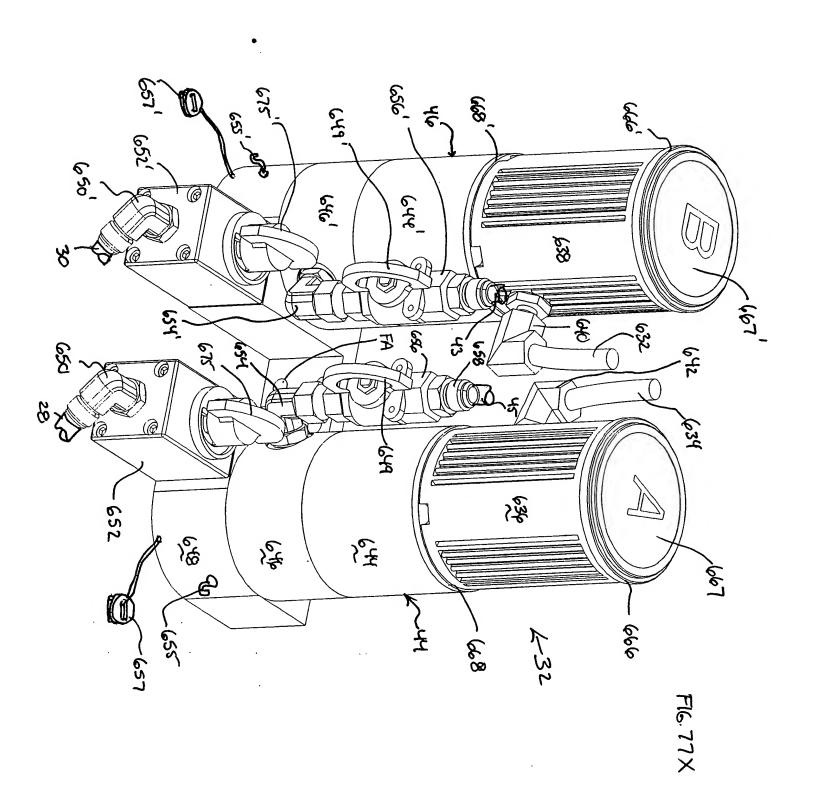


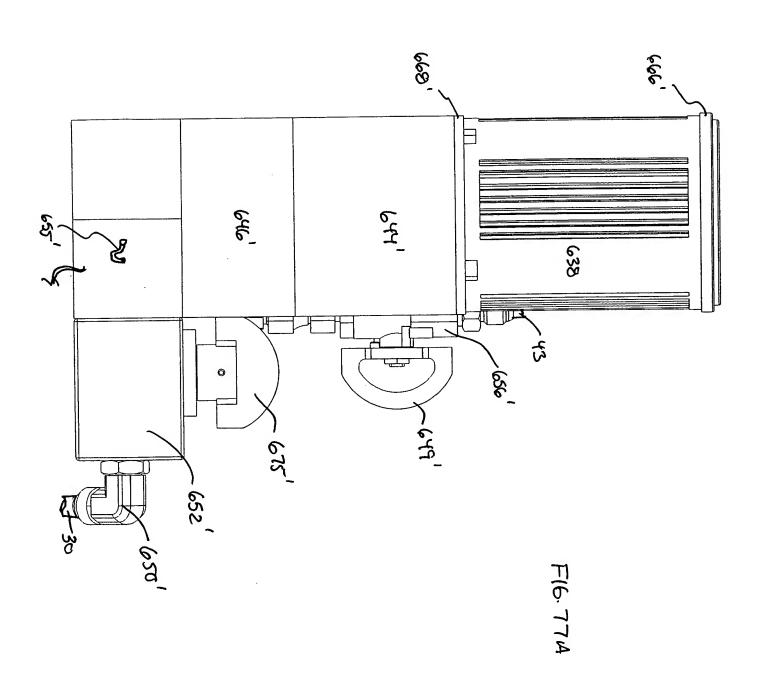


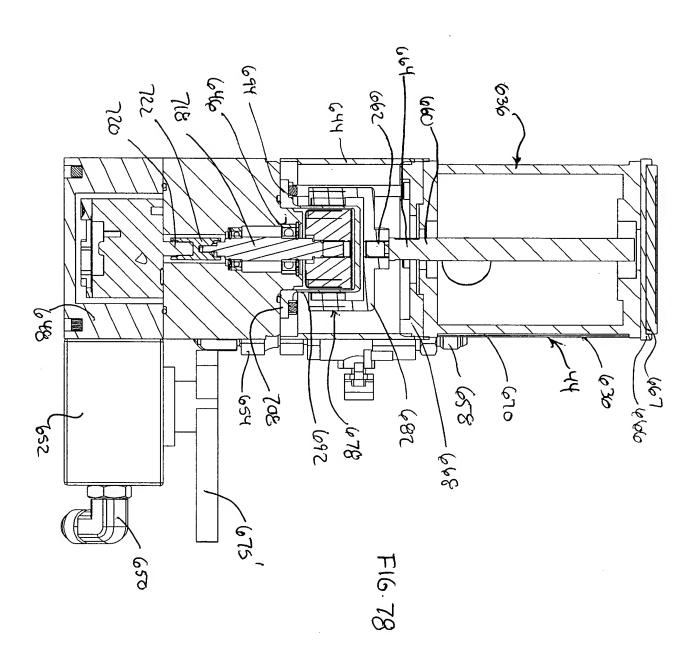


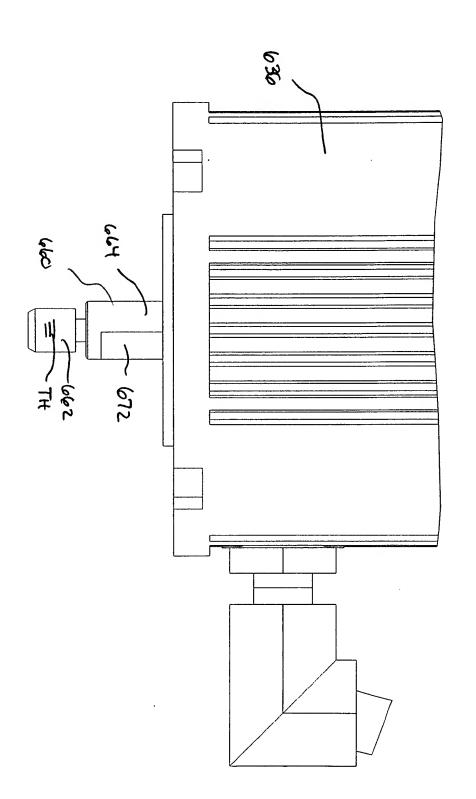


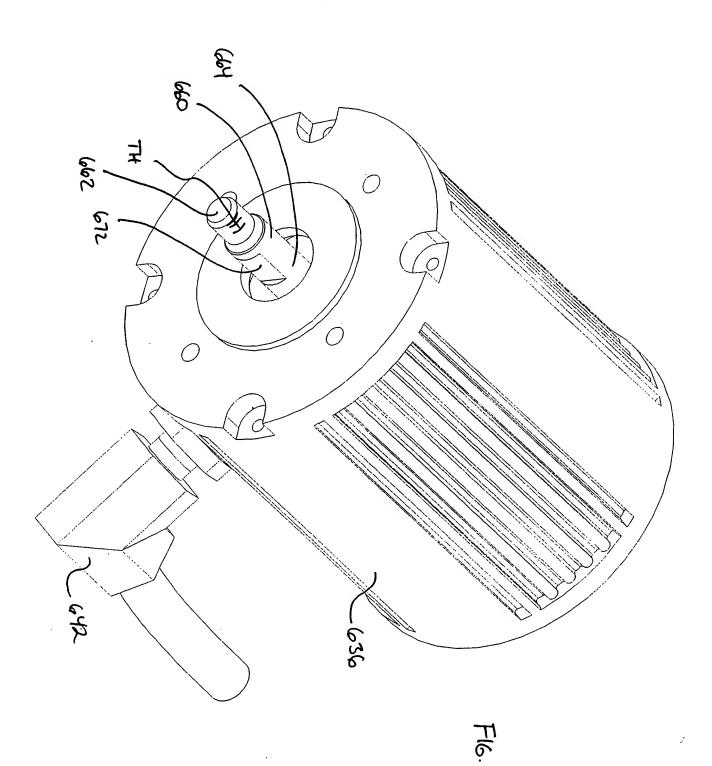


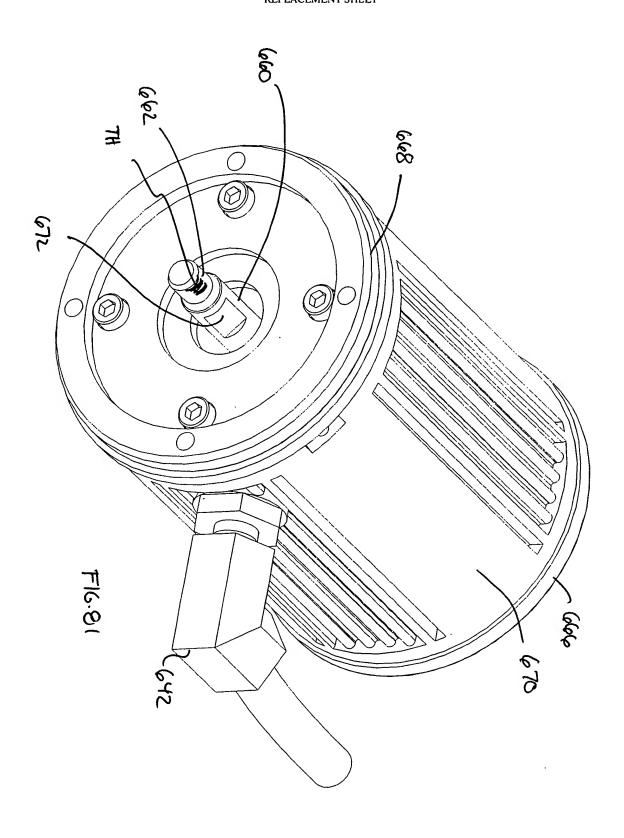


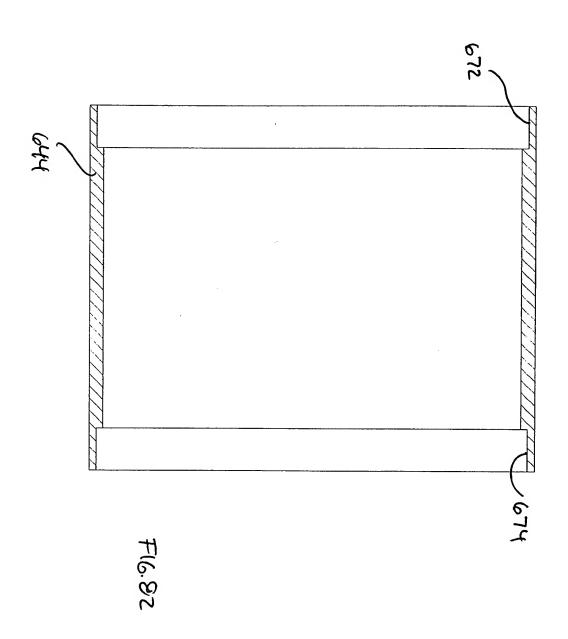


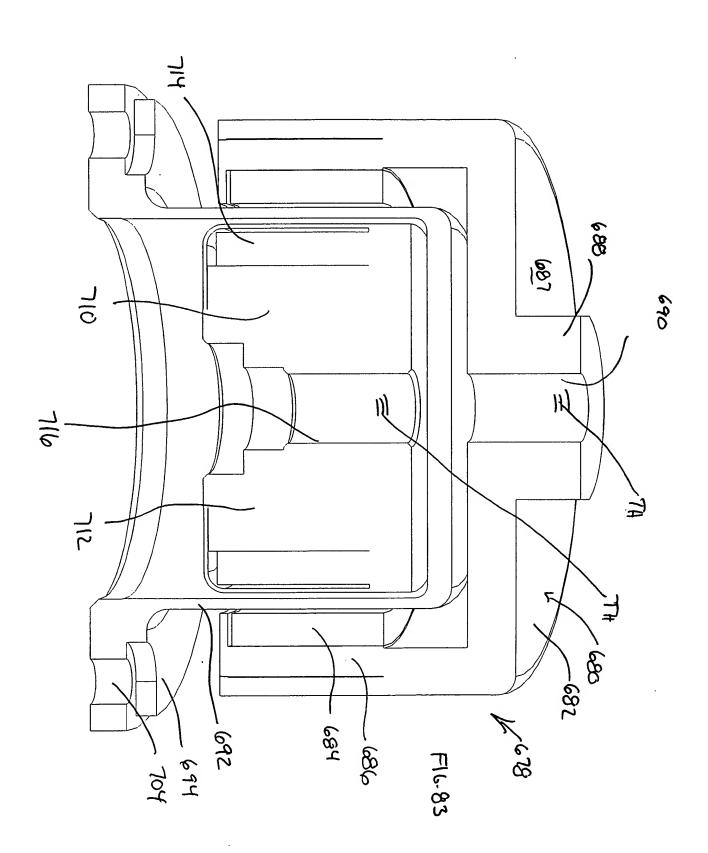


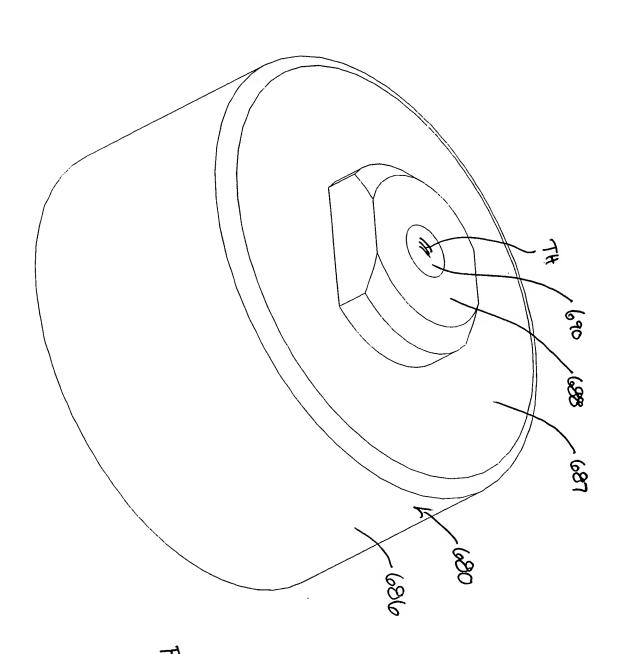


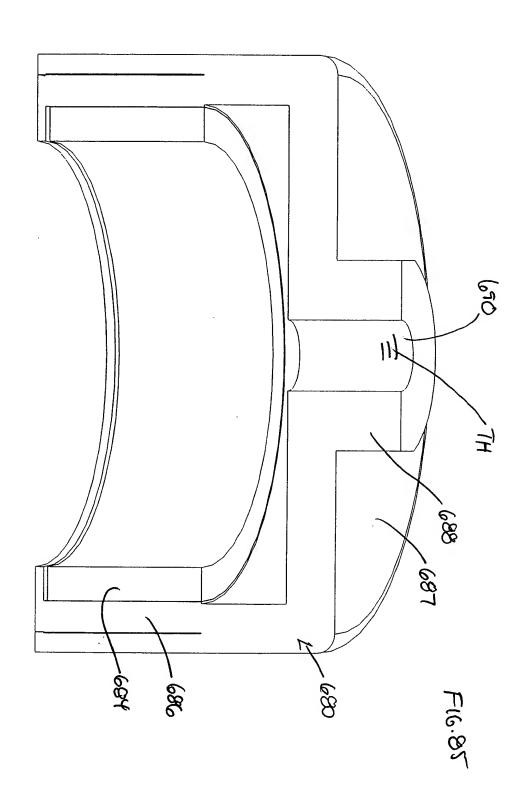


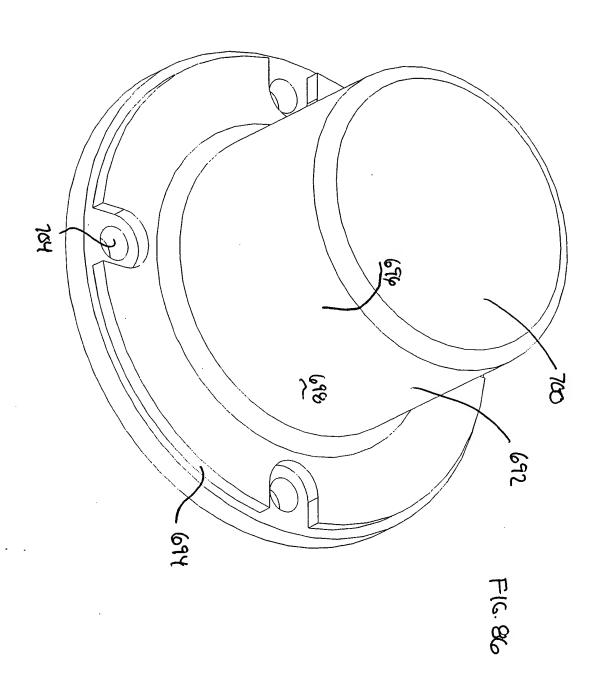


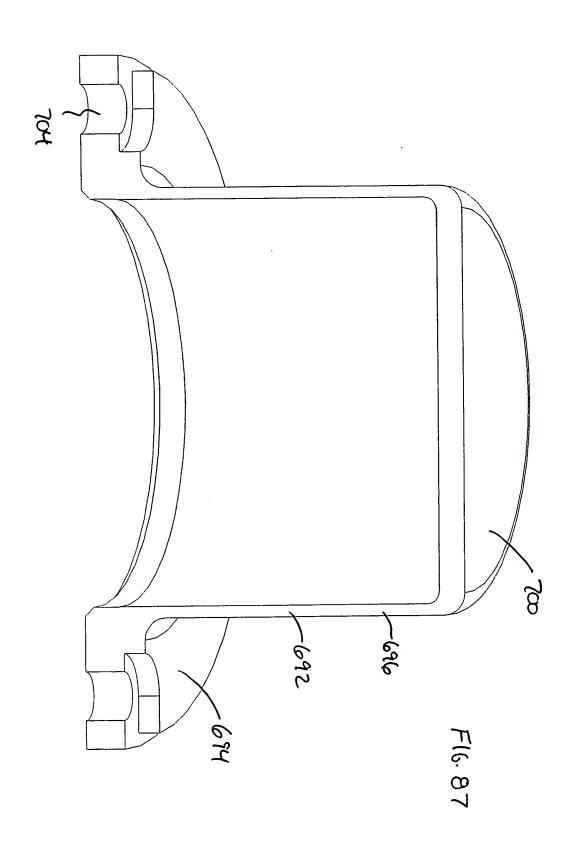


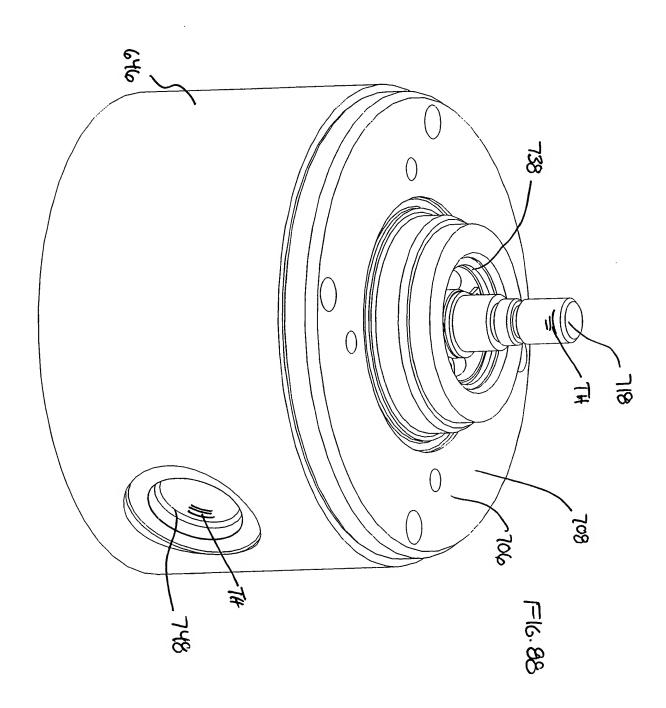


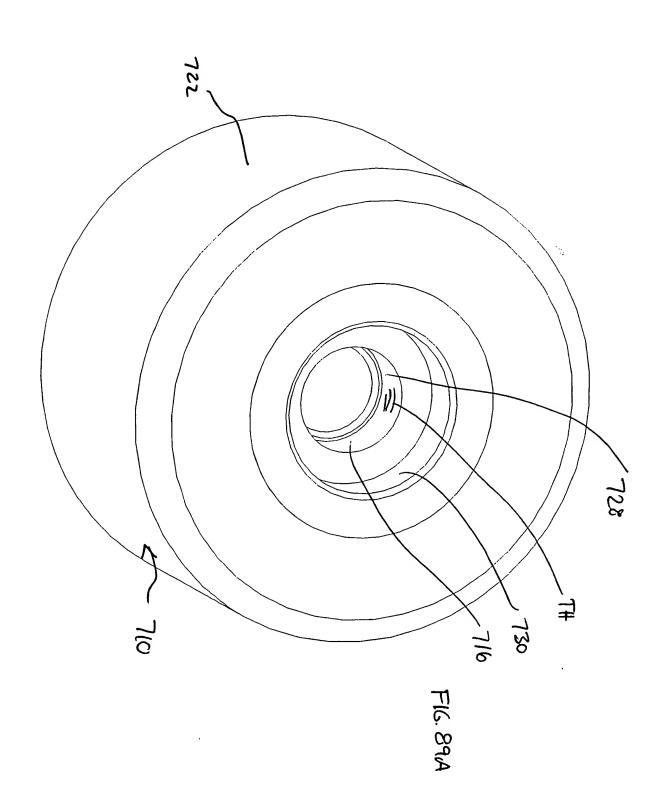


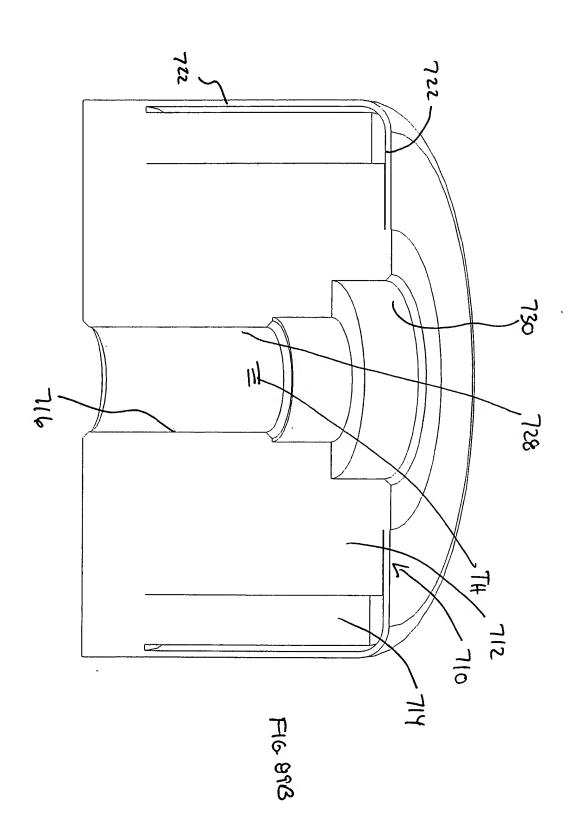


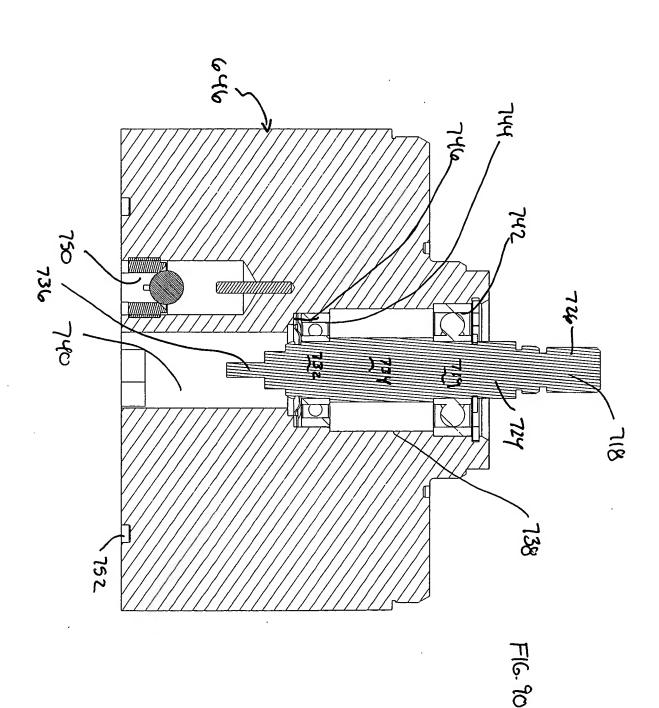


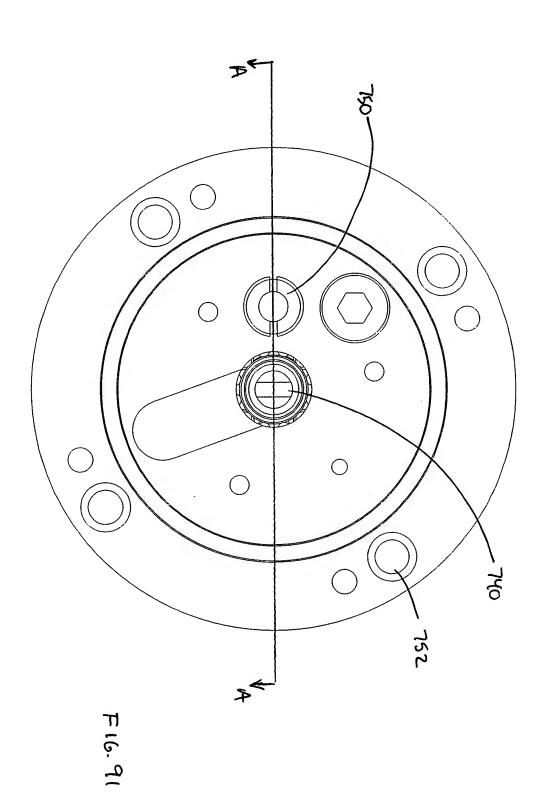


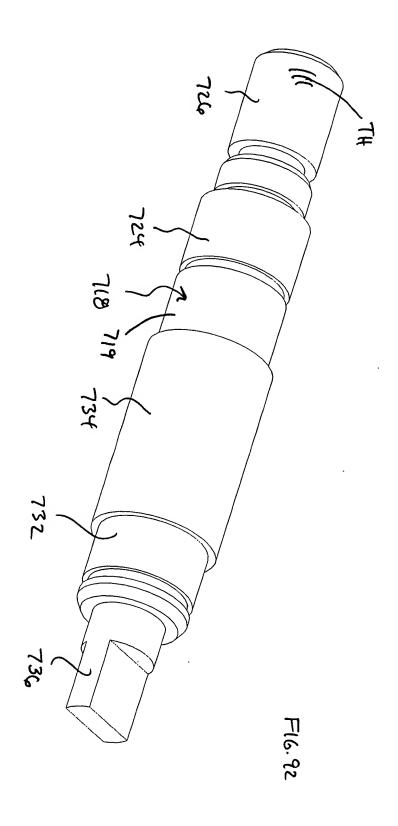












U.S. Patent Application Serial No. 10/798,897

Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

Attorney Docket No.: 034017R004 REPLACEMENT SHEET

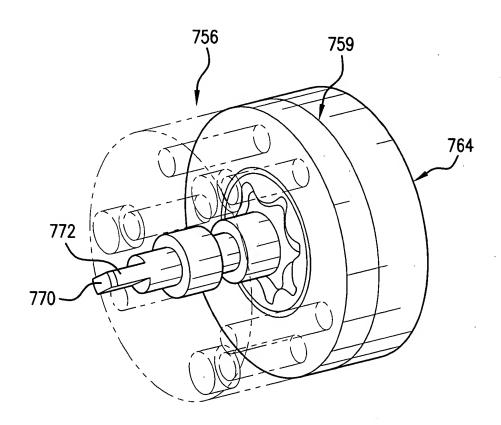
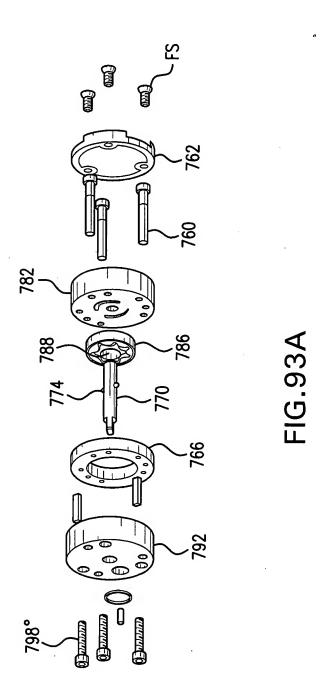


FIG.93X

U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

Attorney Docket No.: 034017R004 REPLACEMENT SHEET



U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM Attorney Docket No.: 034017R004

REPLACEMENT SHEET

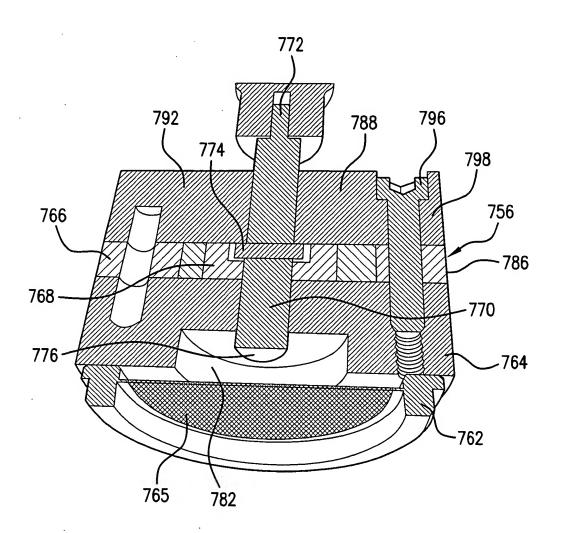


FIG.94

U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

Attorney Docket No.: 034017R004 REPLACEMENT SHEET

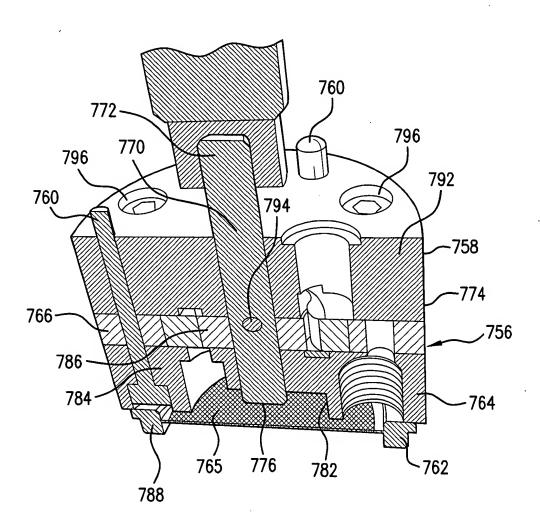
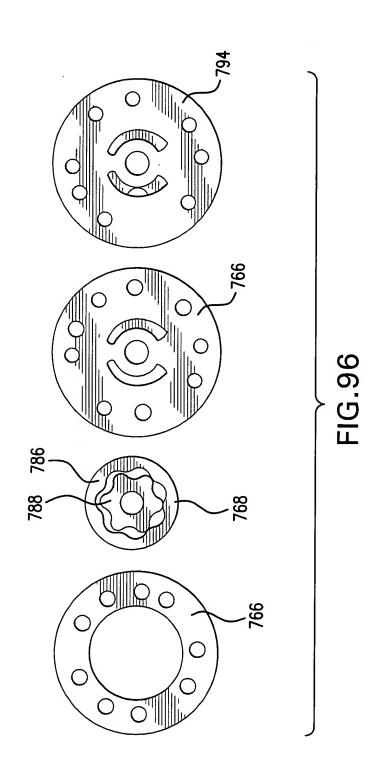


FIG.95

U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM

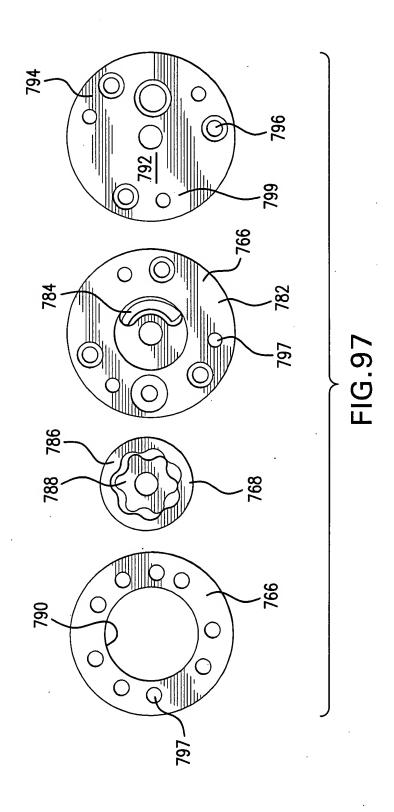
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
REPLACEMENT SHEET

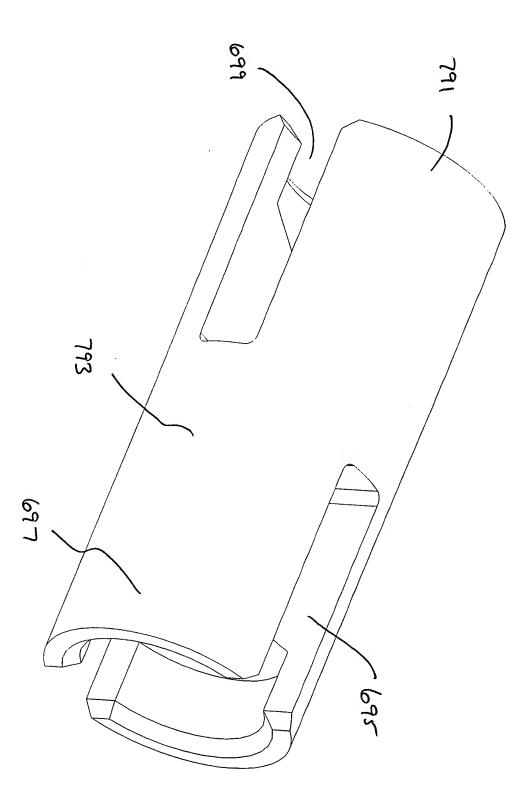


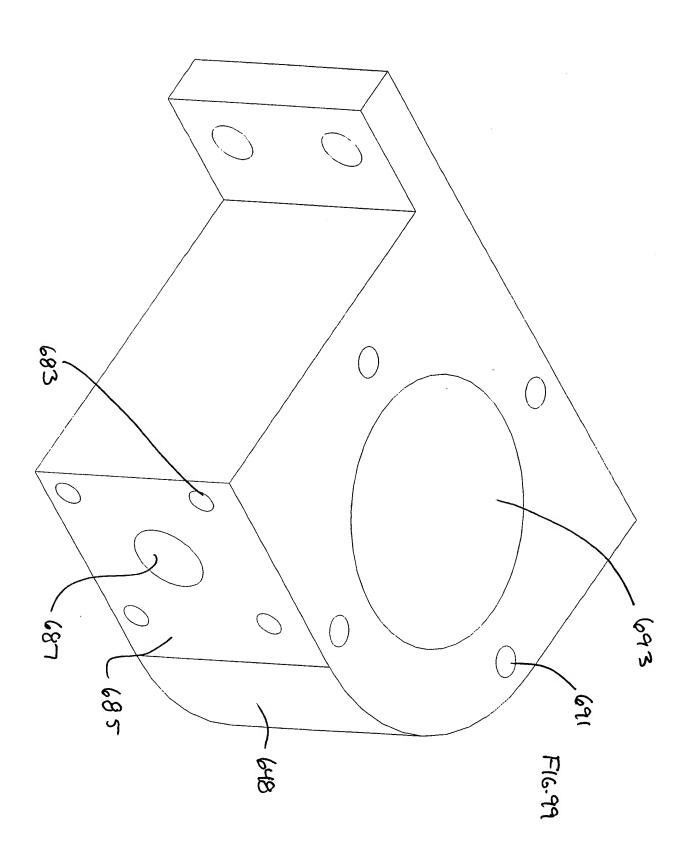
U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM

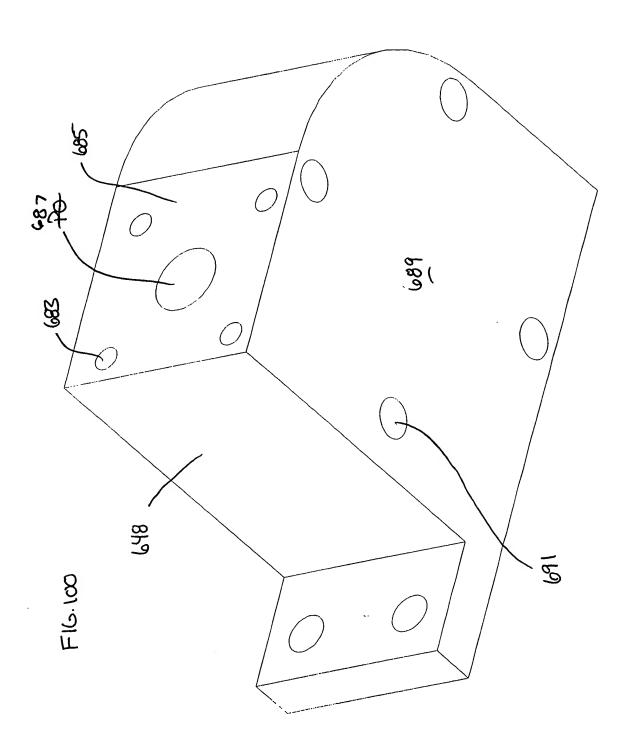
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM Attorney Docket No.: 034017R004

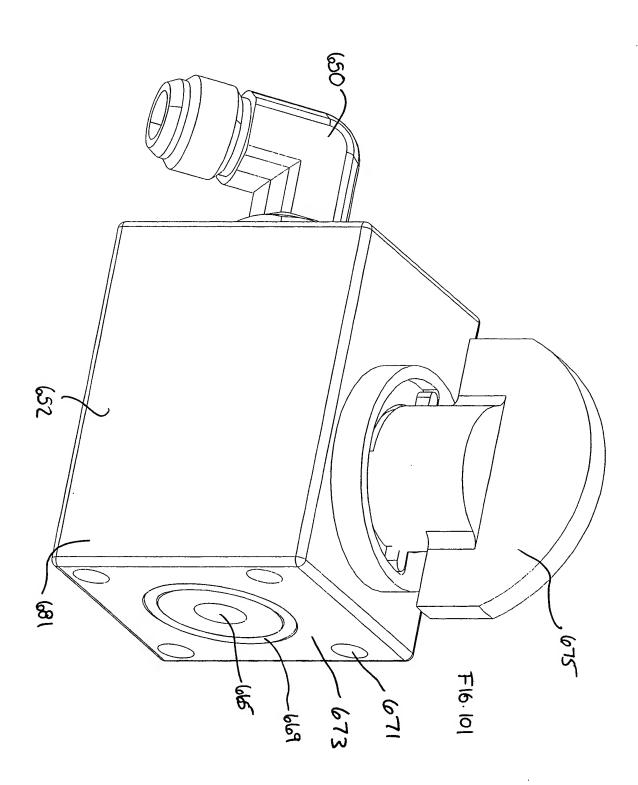
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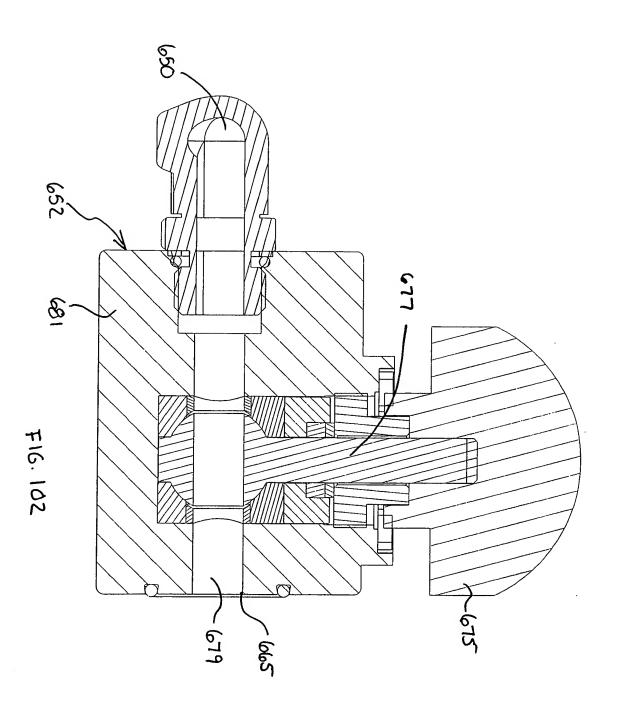












U.S. Patent Application Serial No. 10/798,897

Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM
Attorney Docket No.: 034017R004
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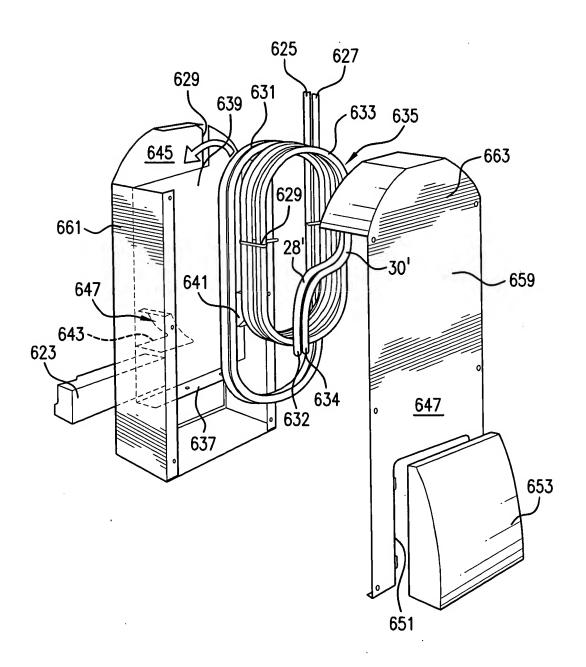
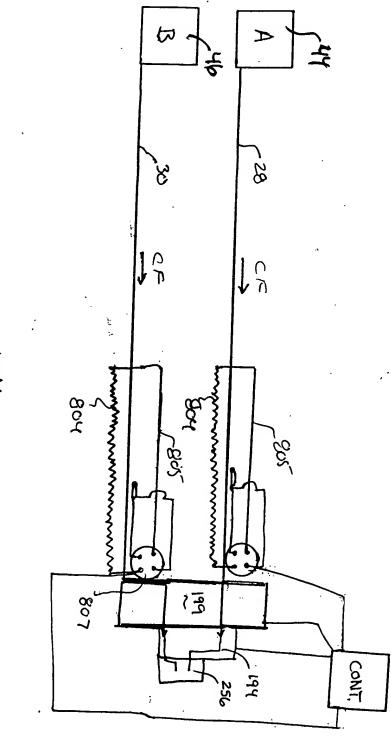
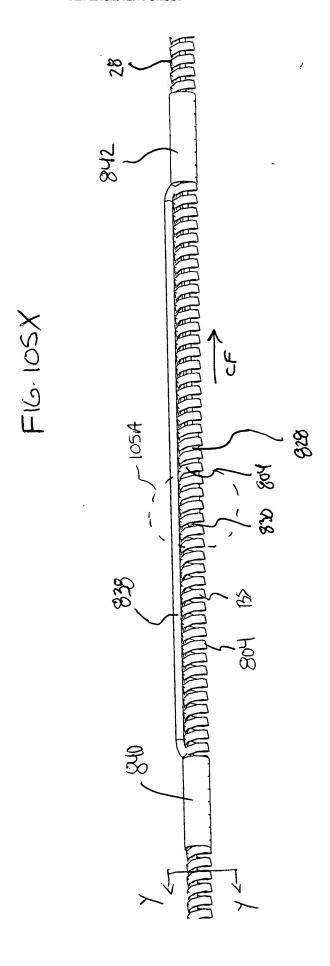
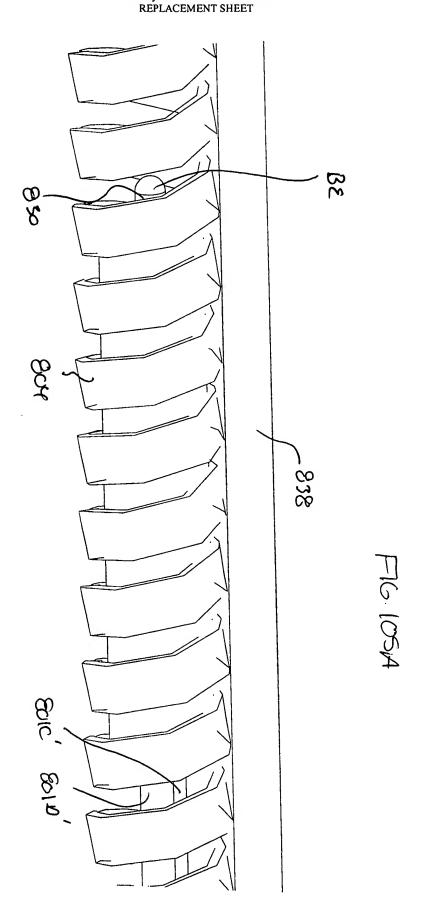


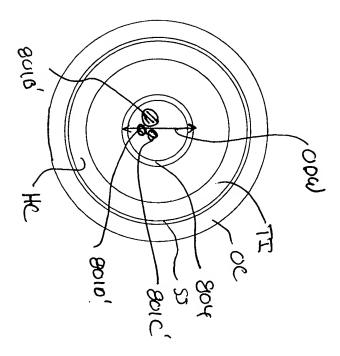
FIG.103



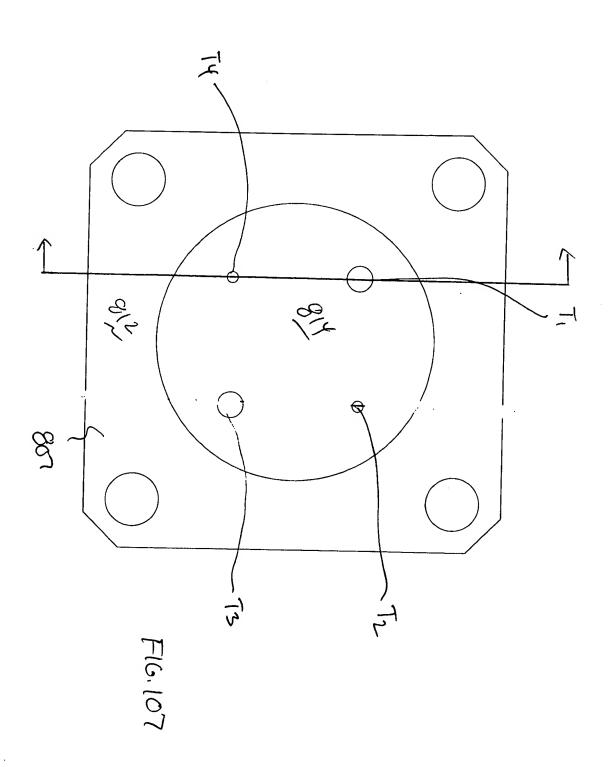
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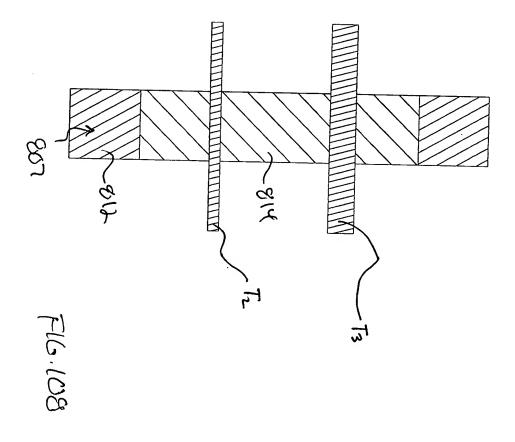


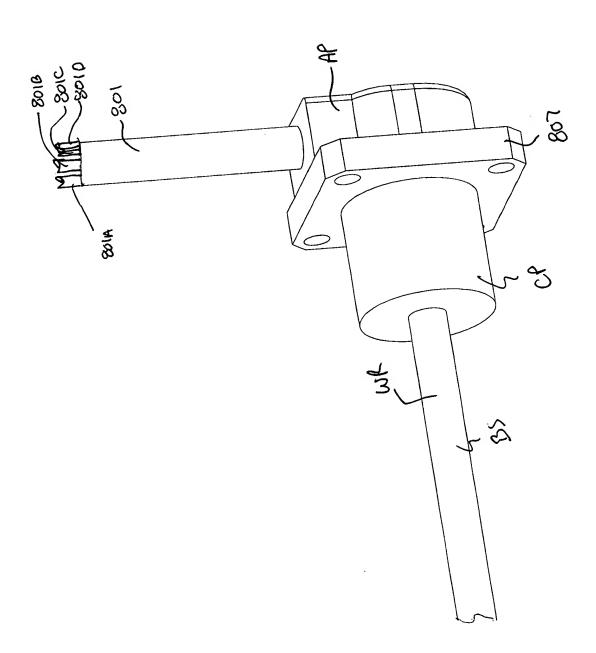


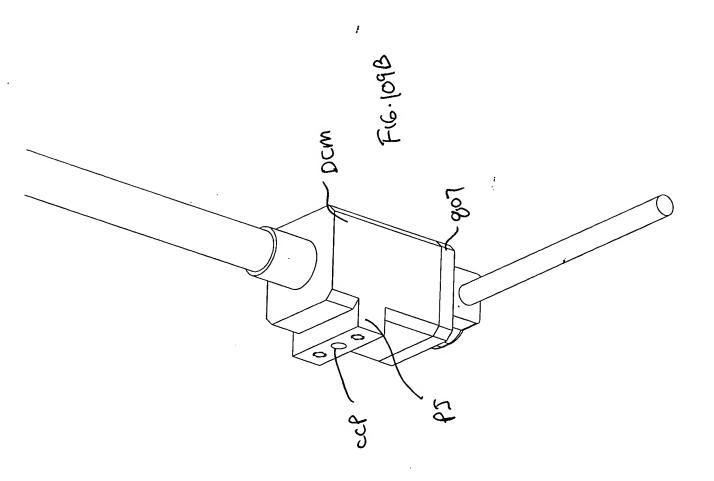


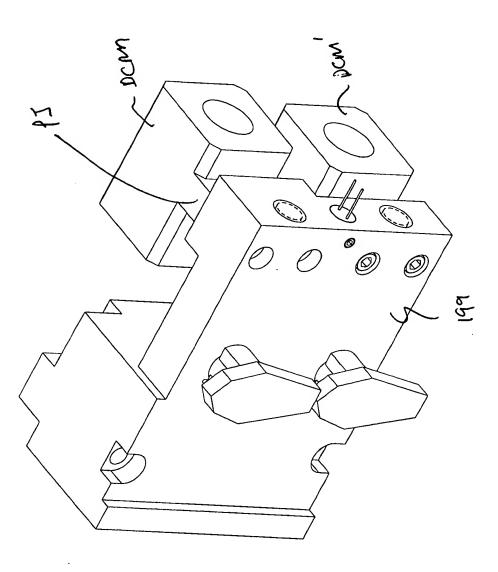
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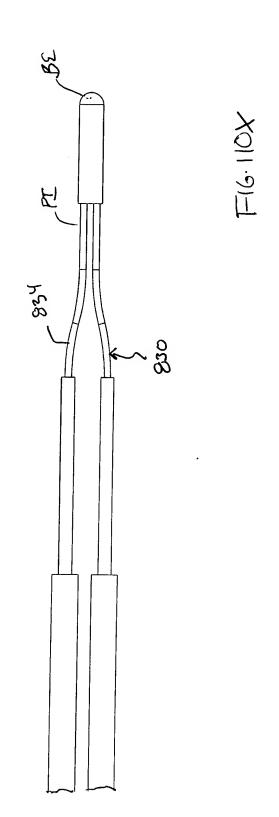


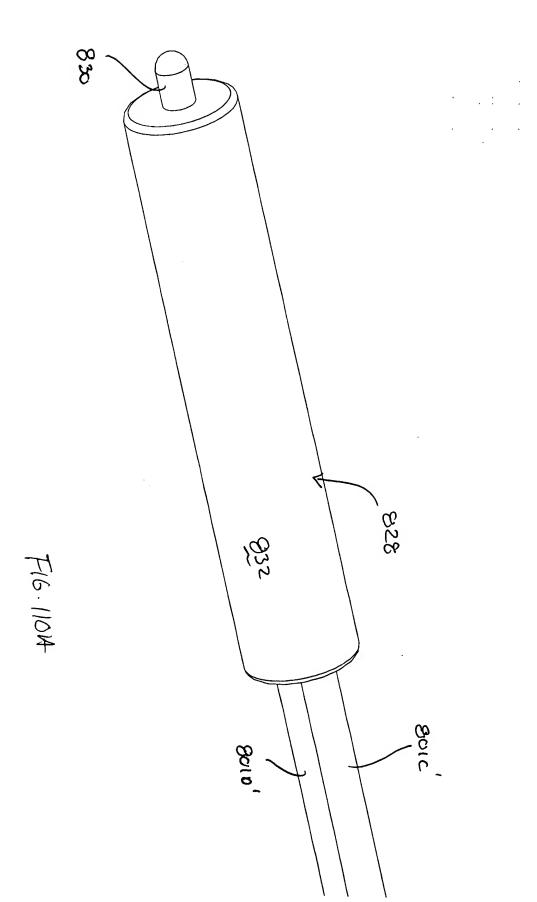


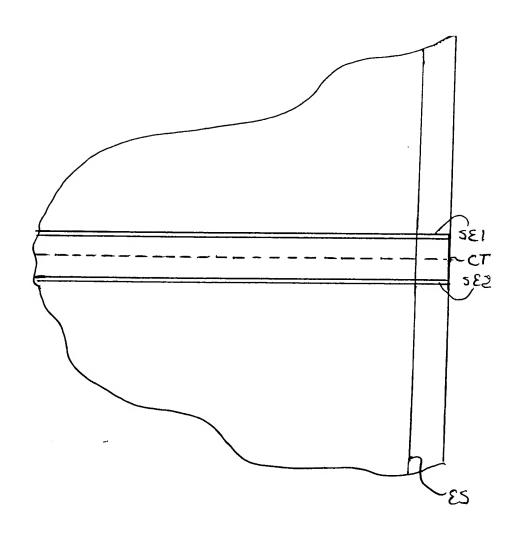




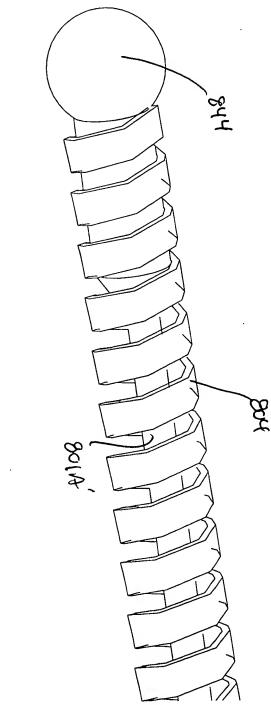


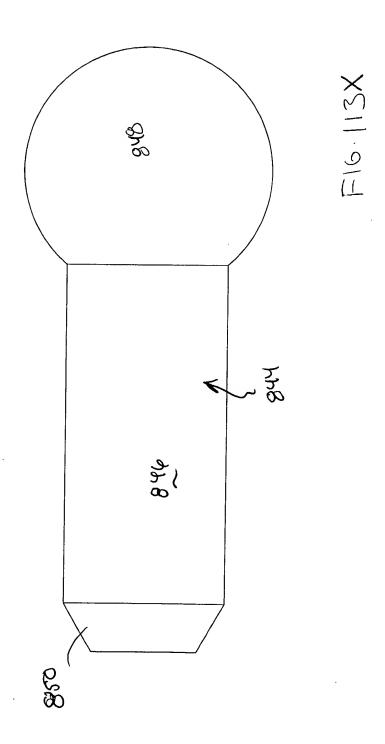


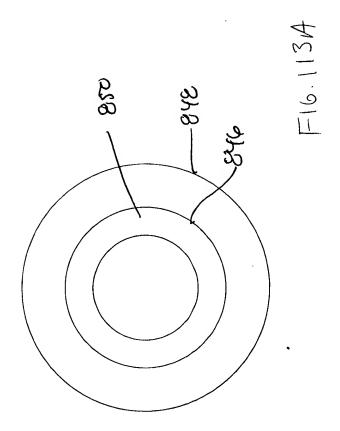


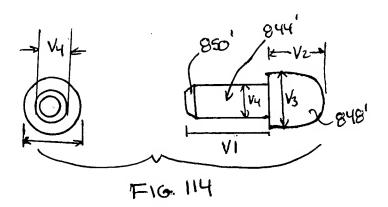


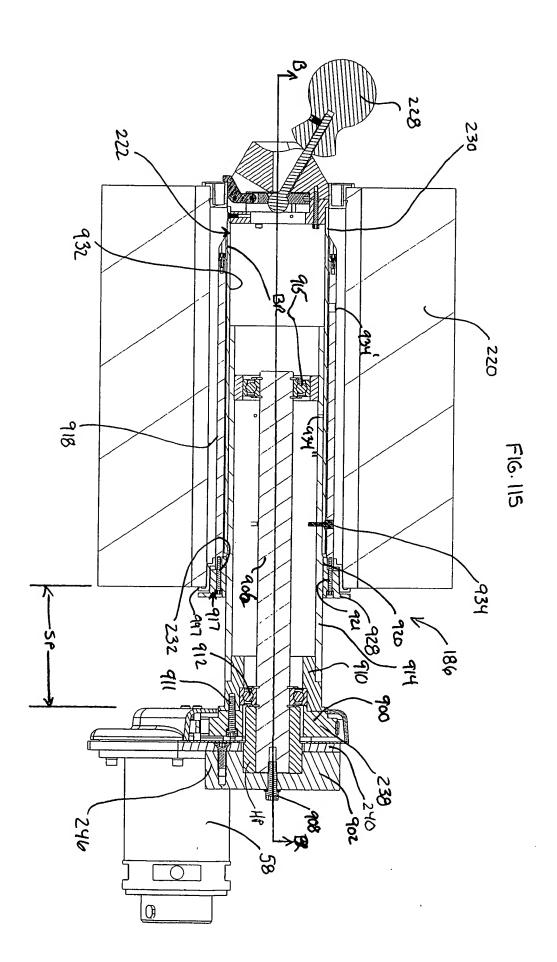
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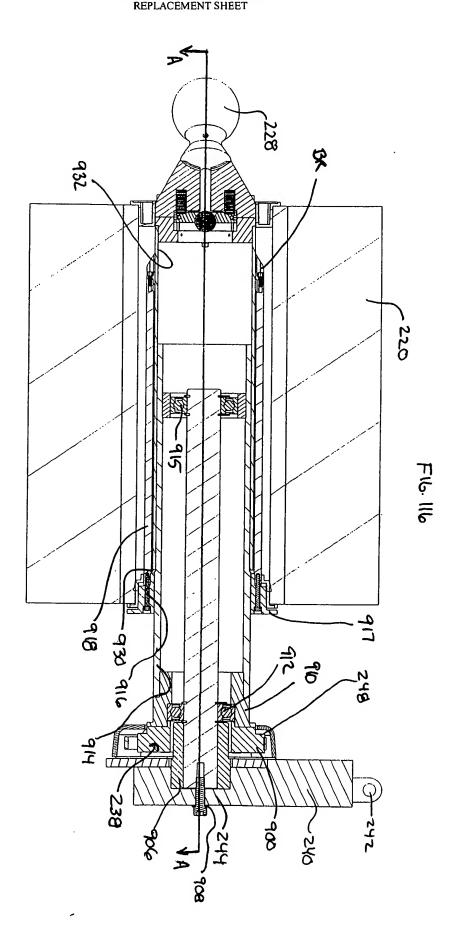


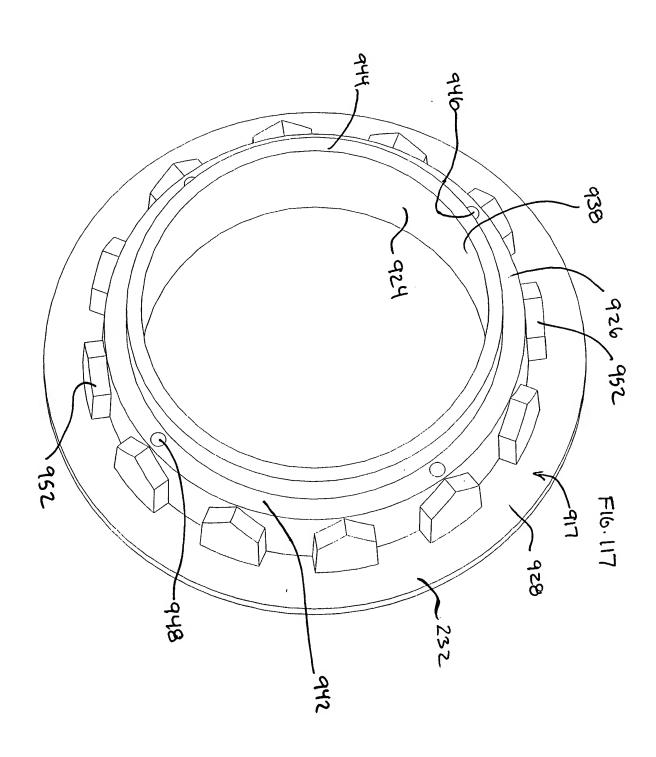


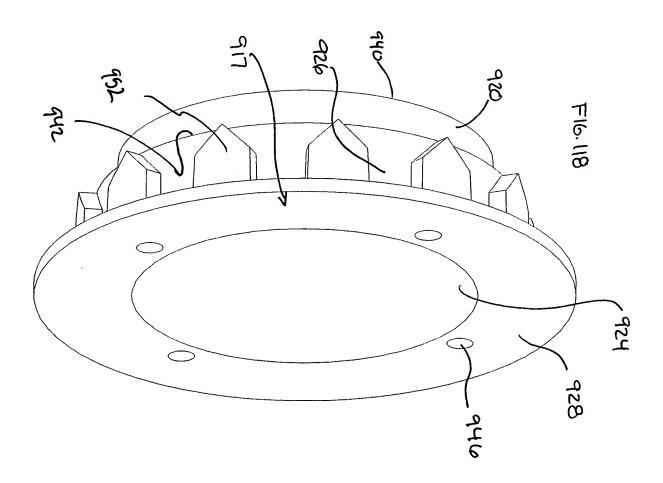


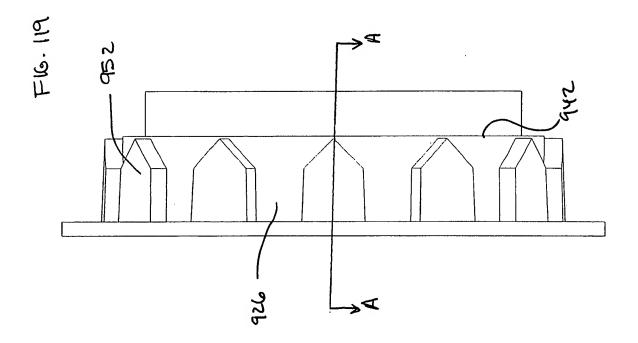


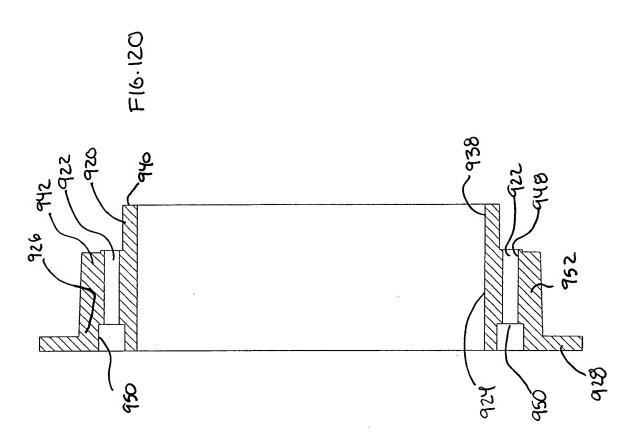


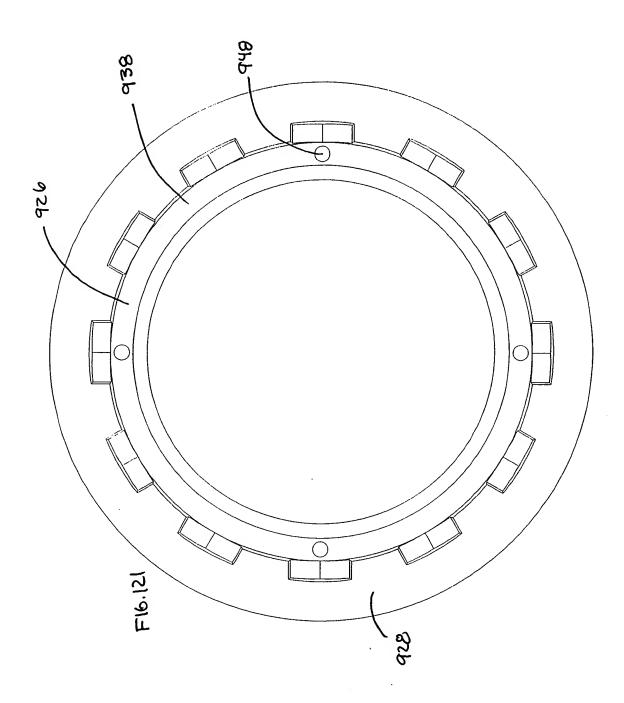


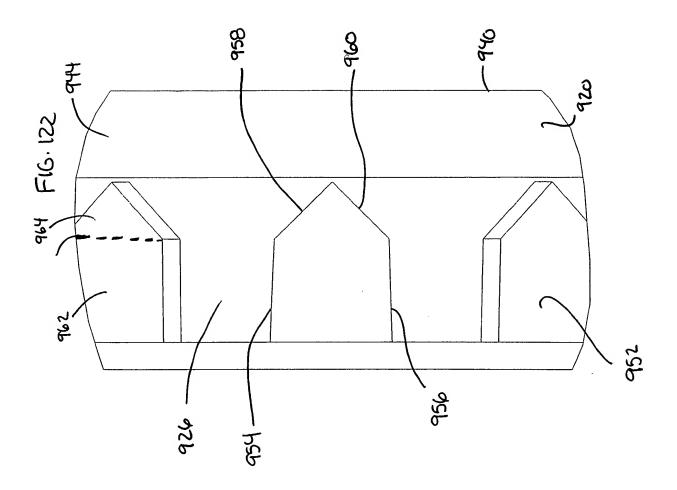


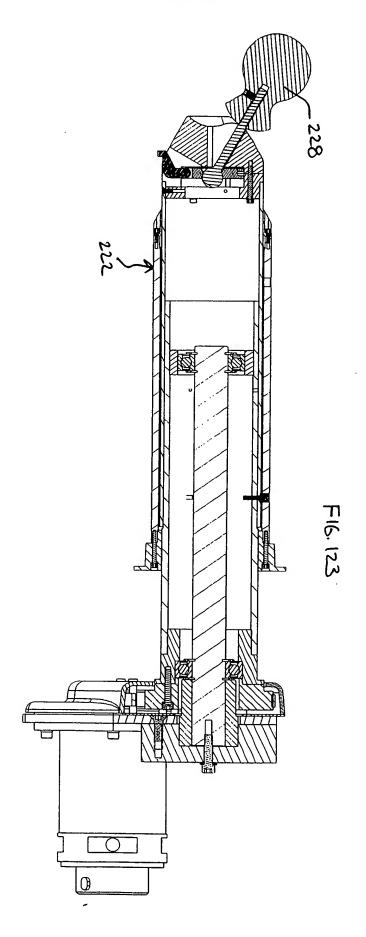


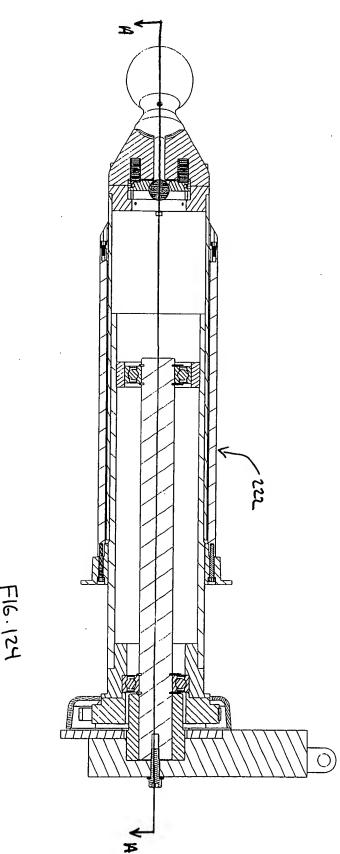


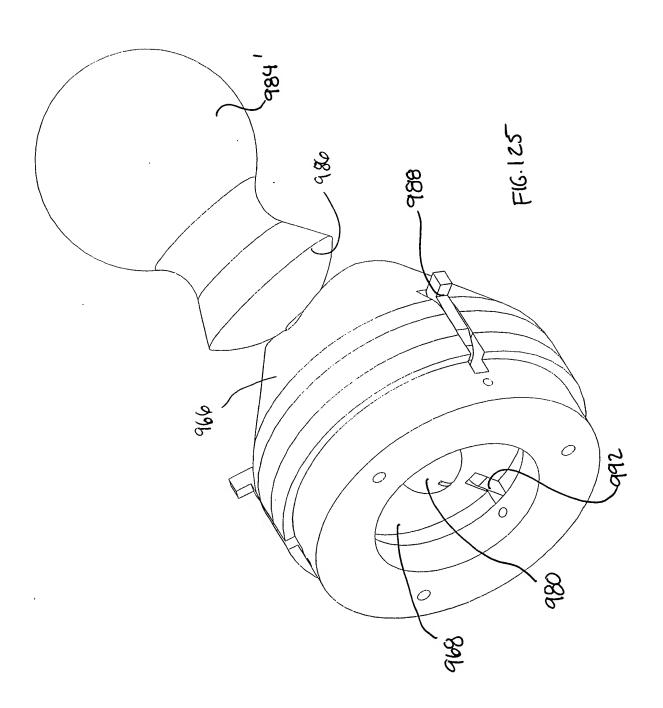


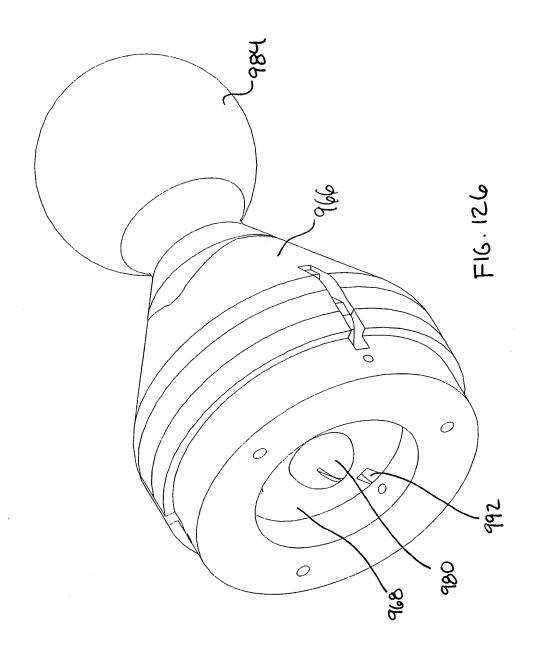


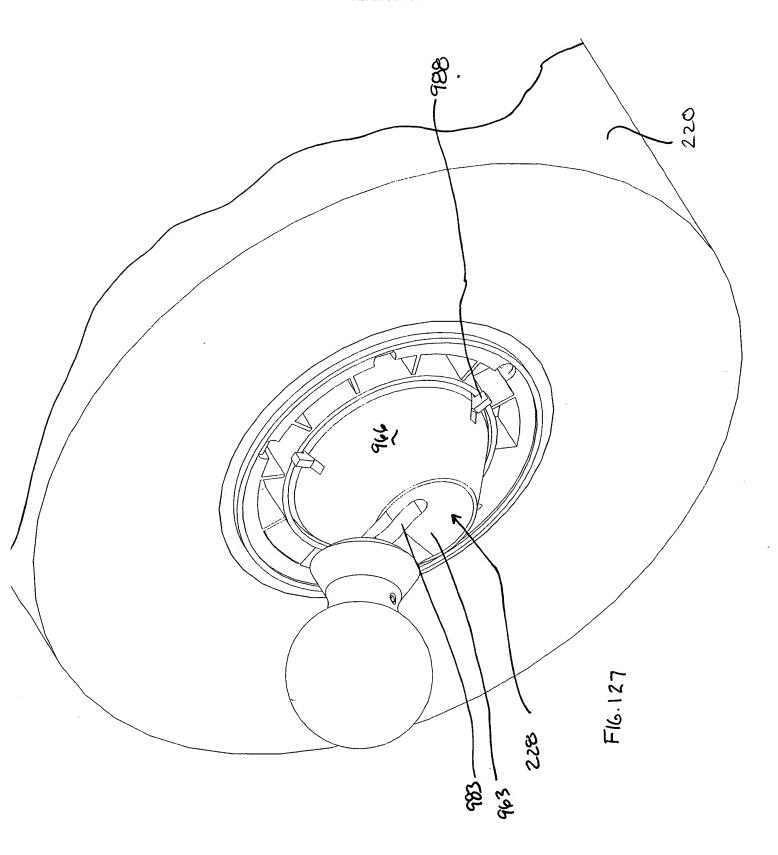


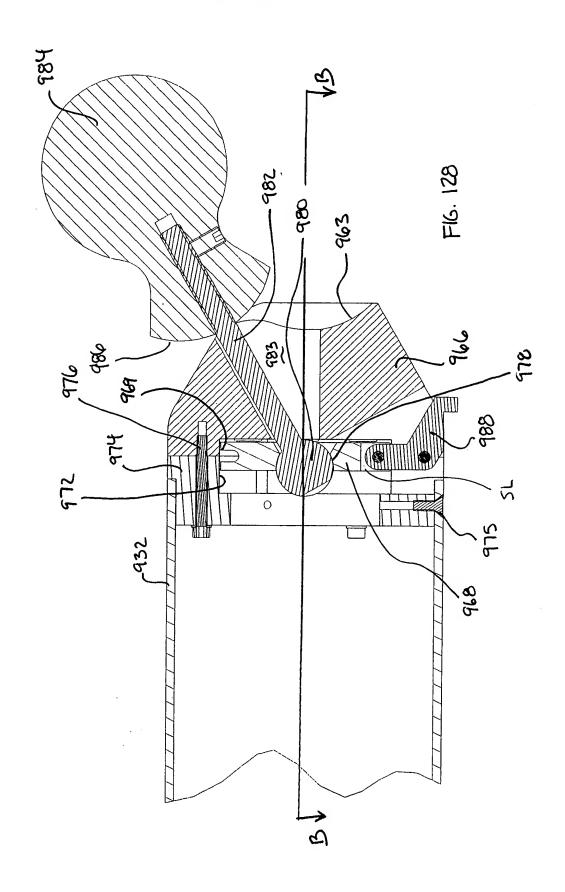


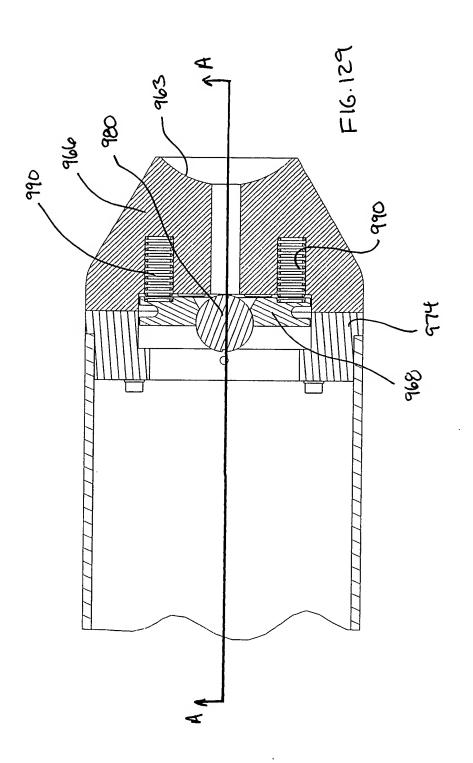


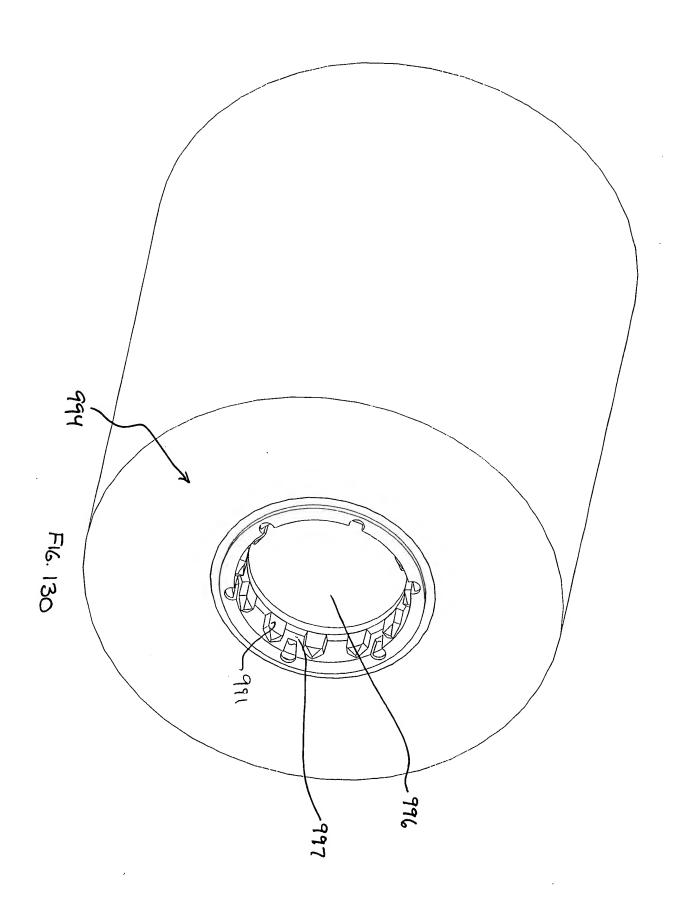


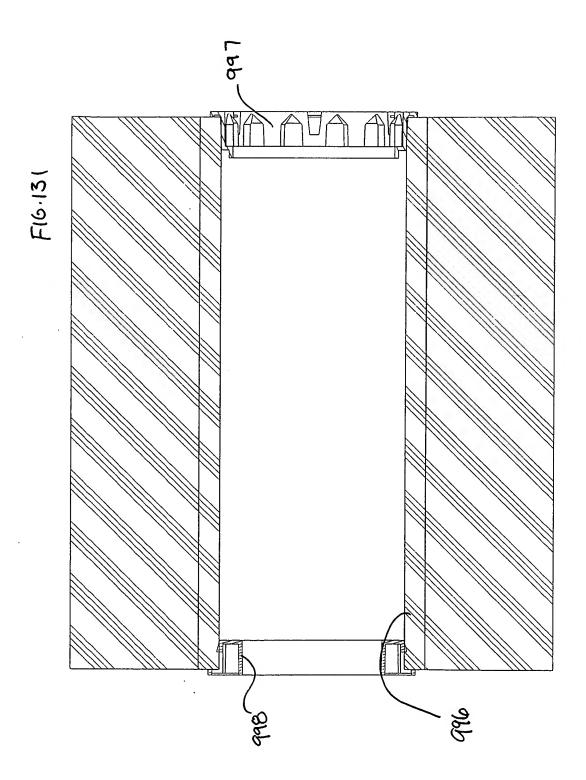


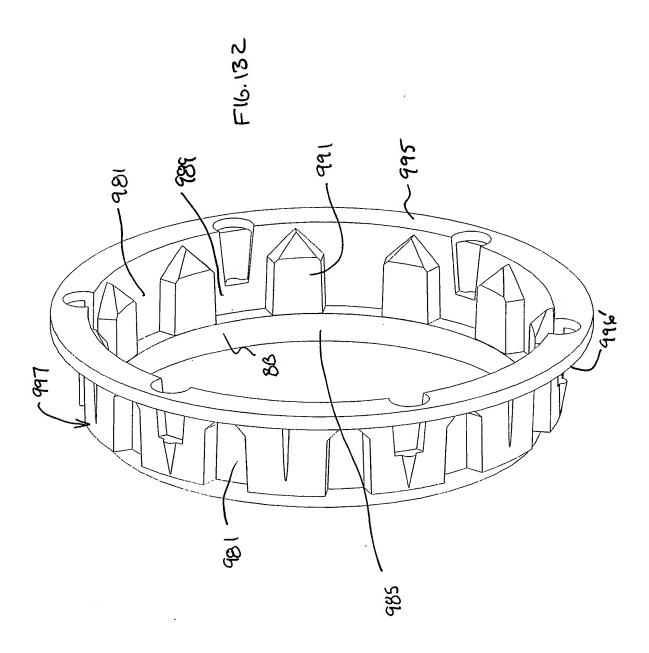


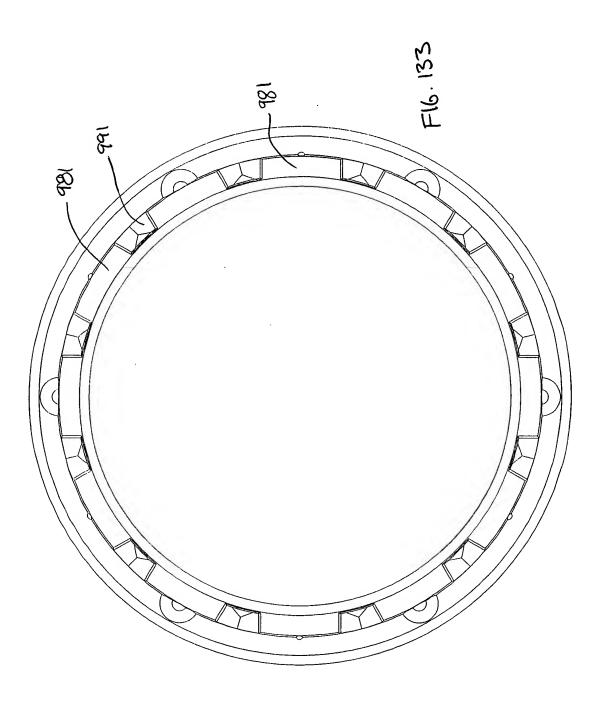


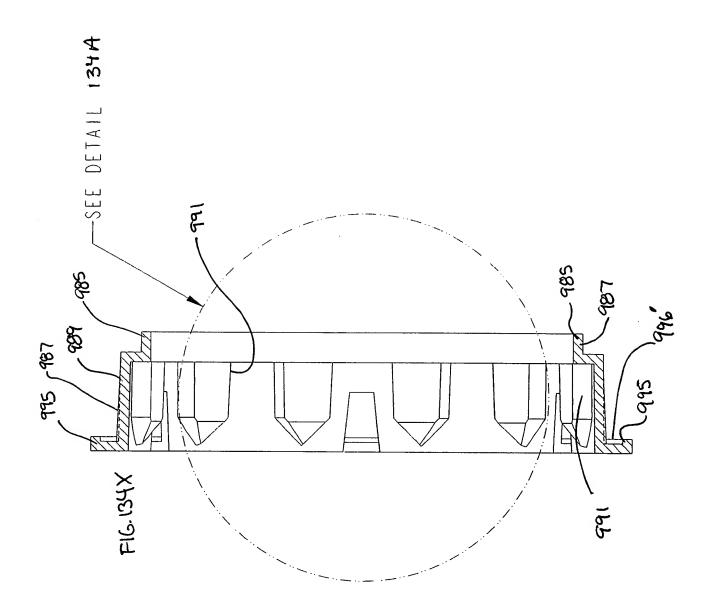


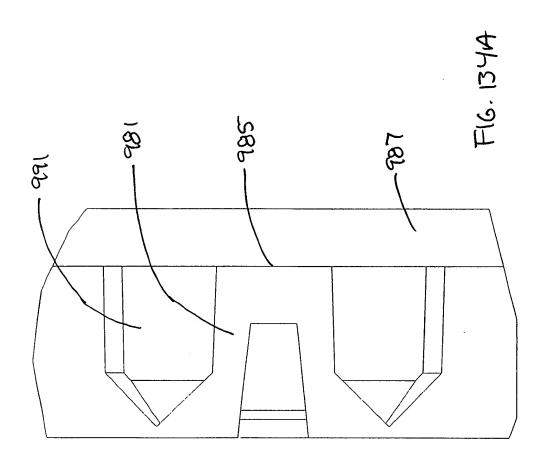


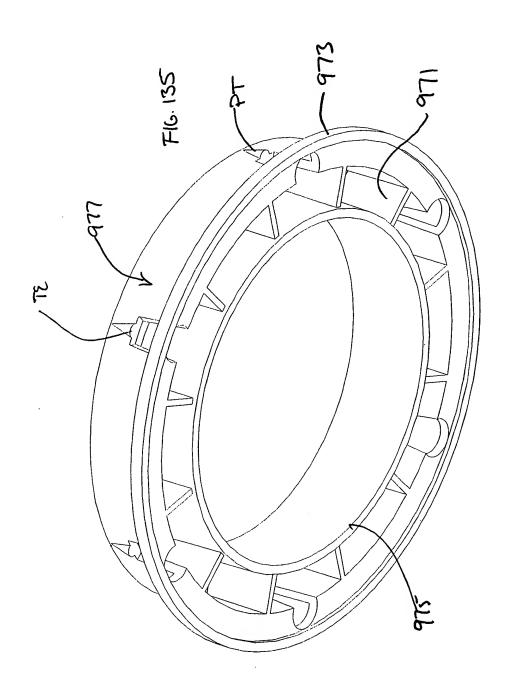


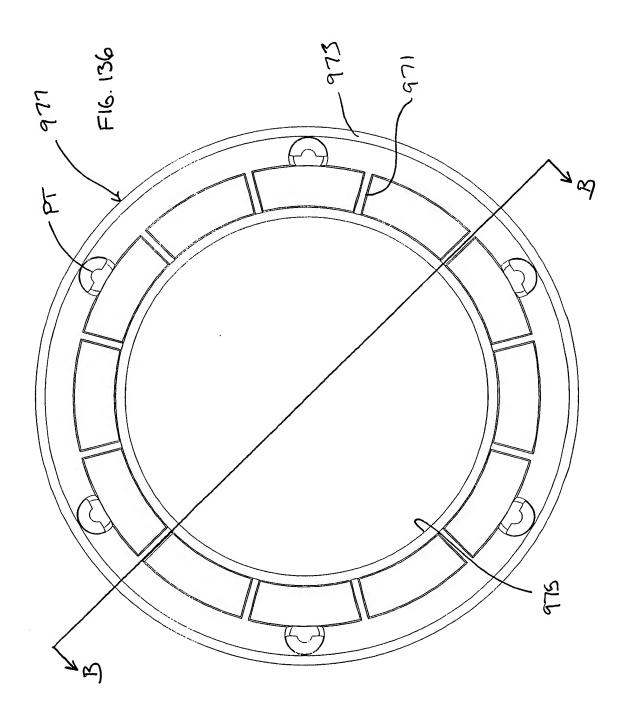




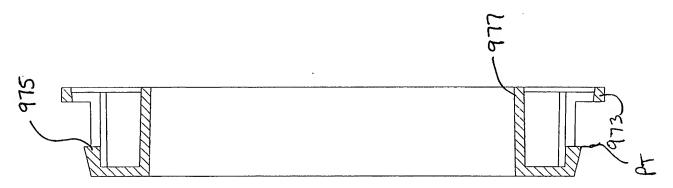


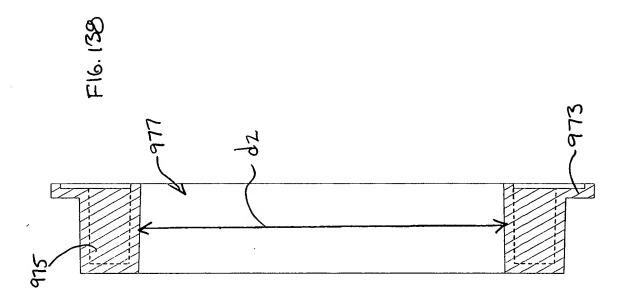


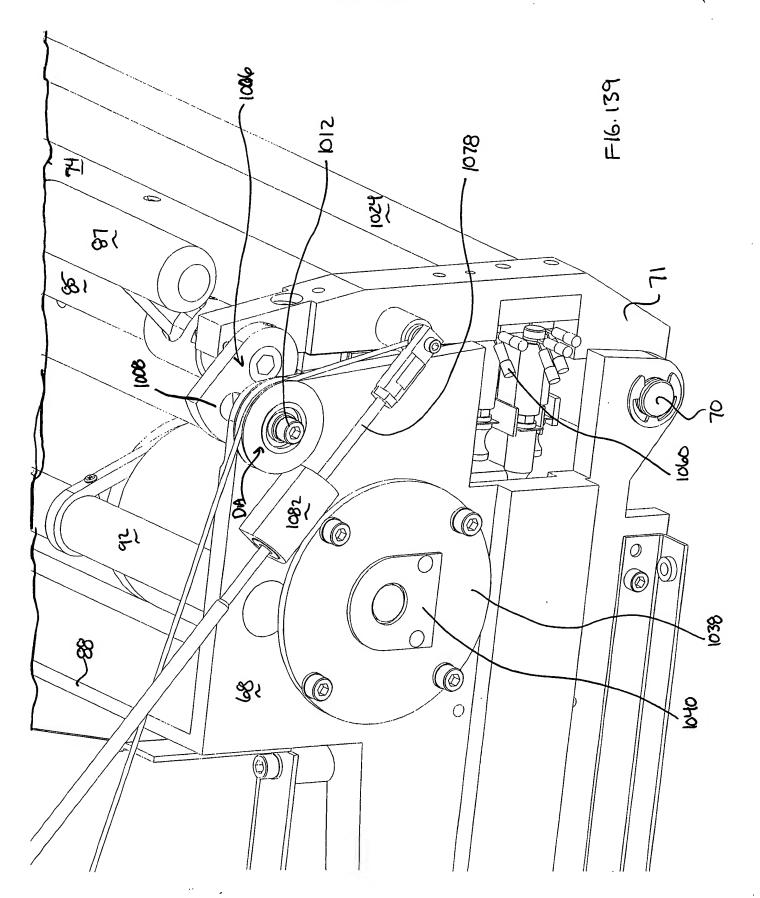


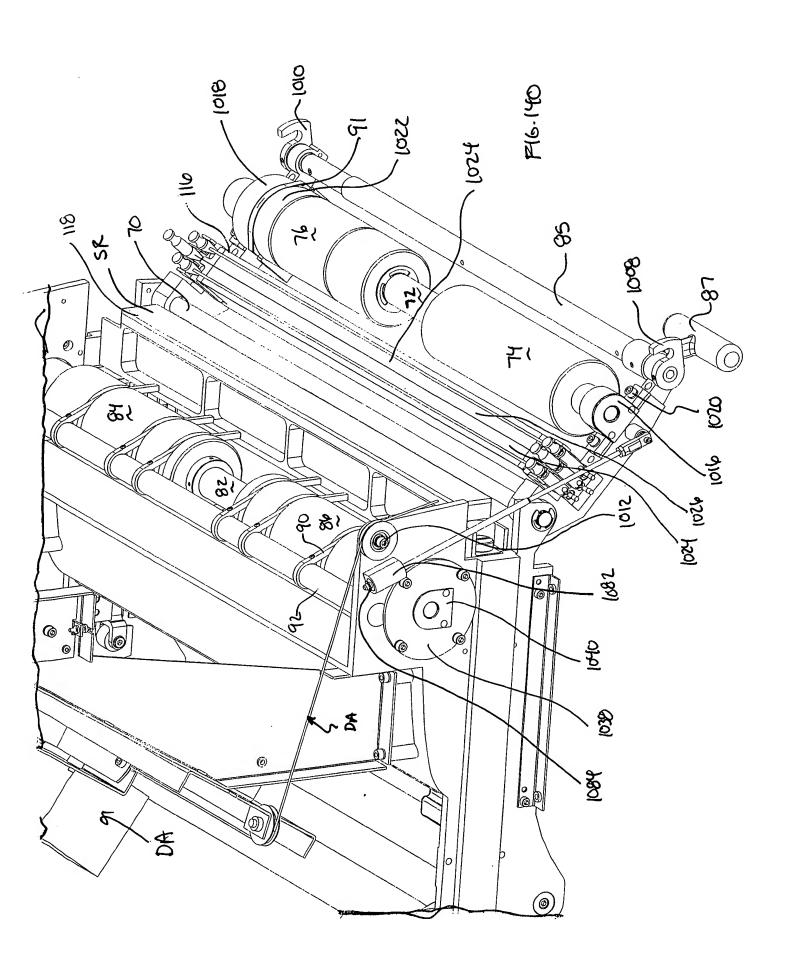


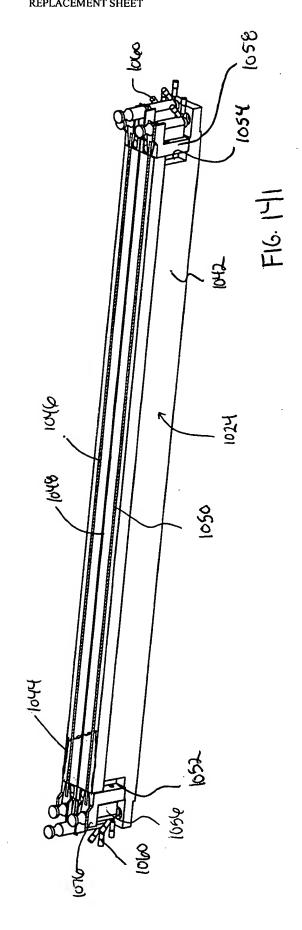


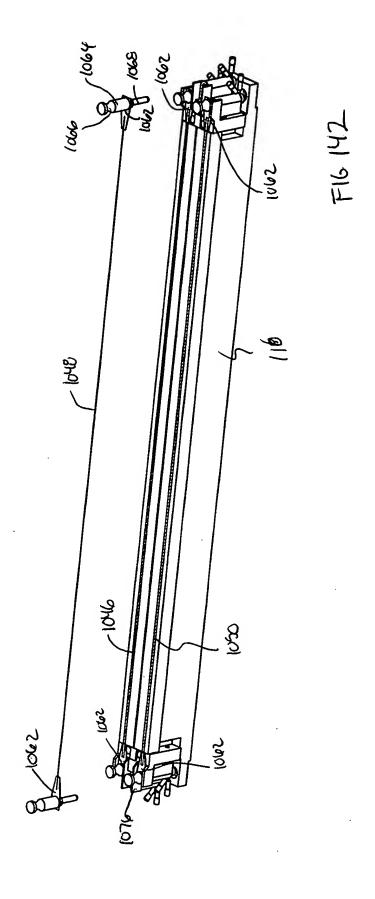


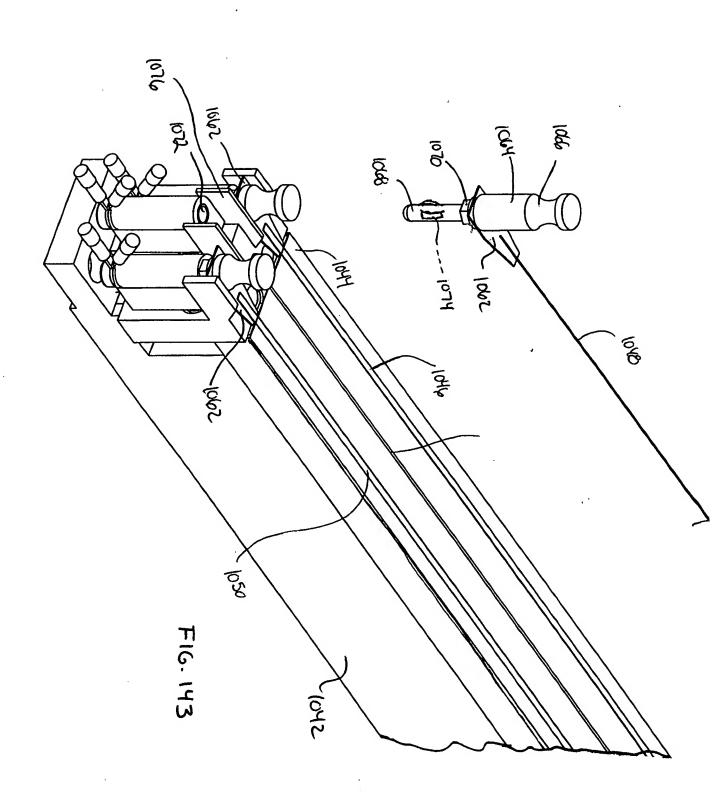


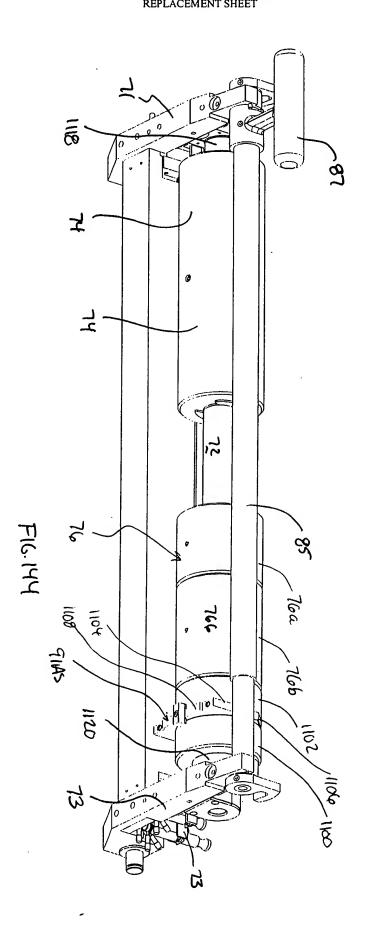


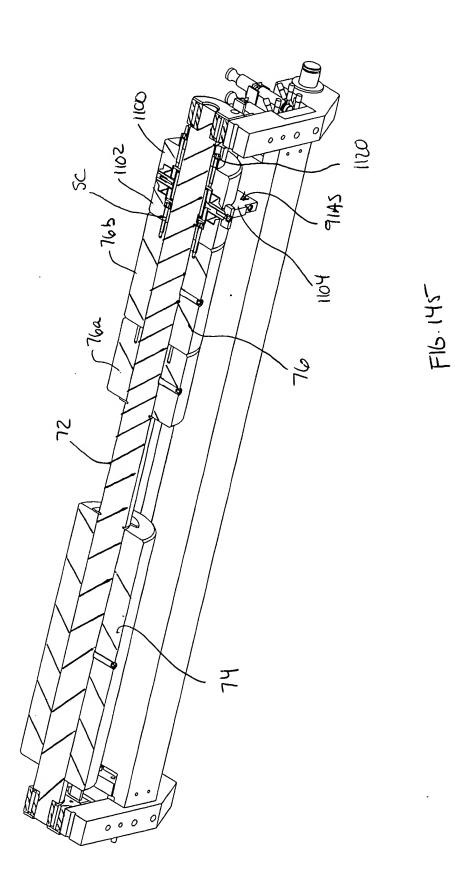


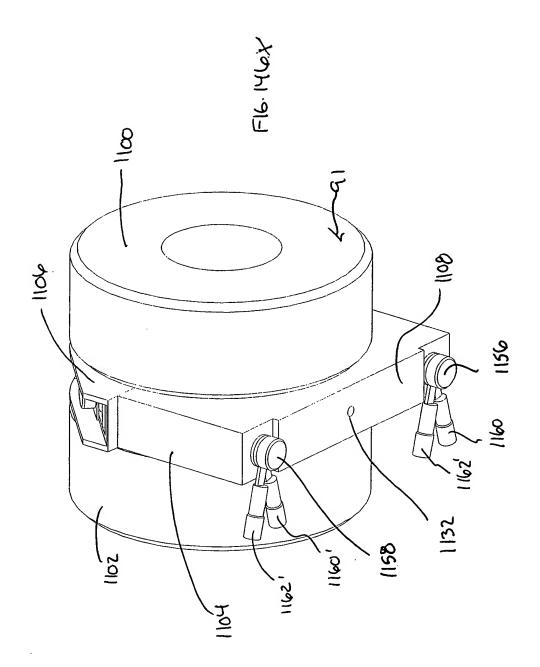


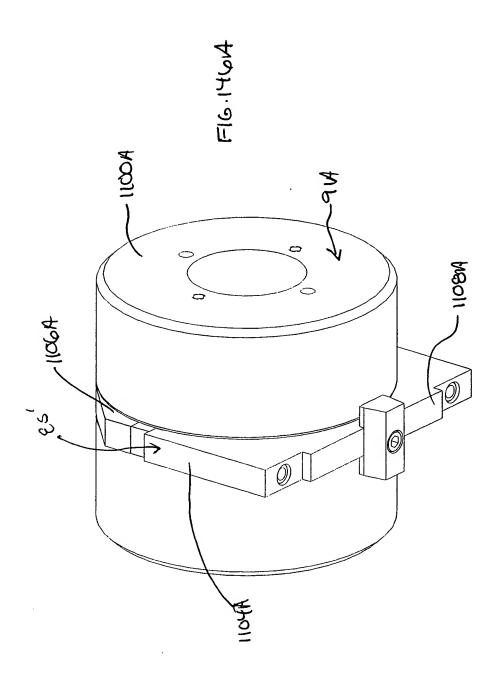


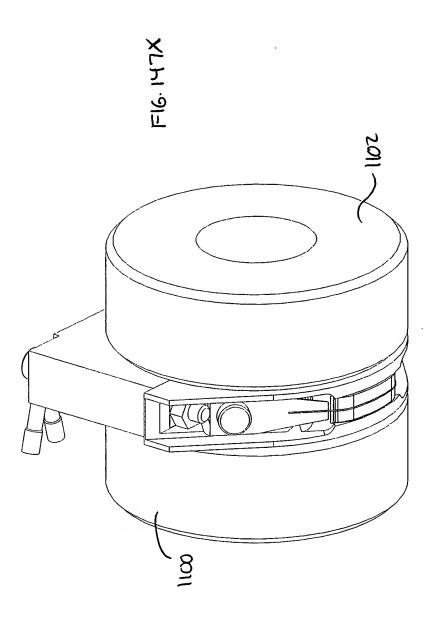


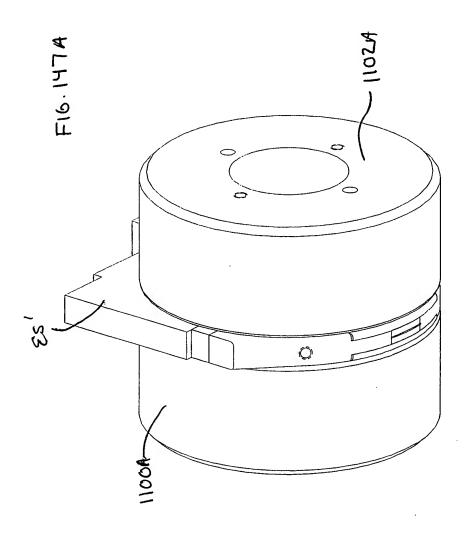


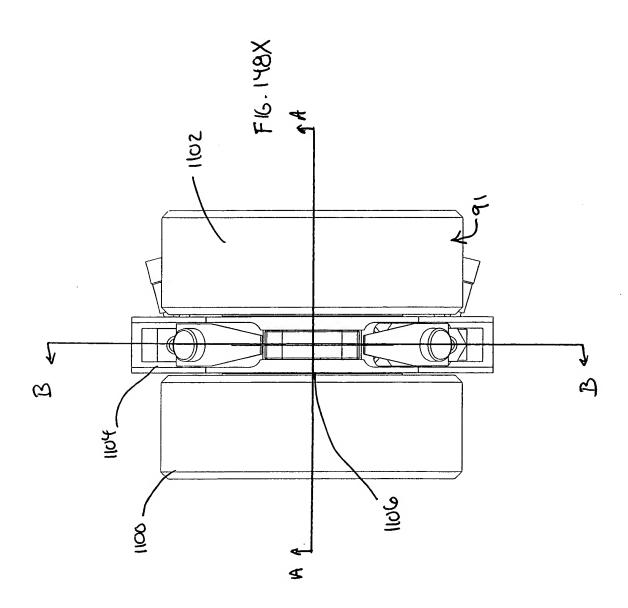


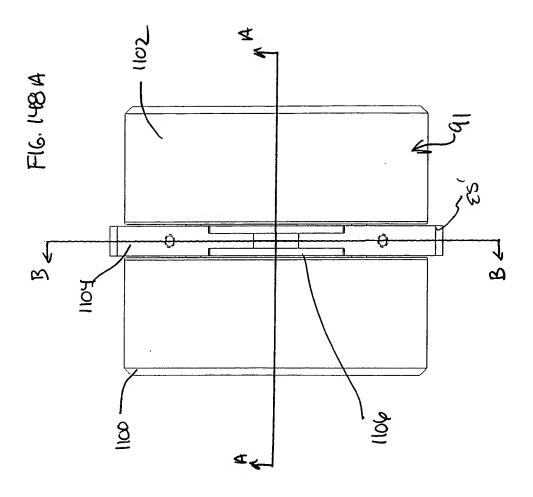




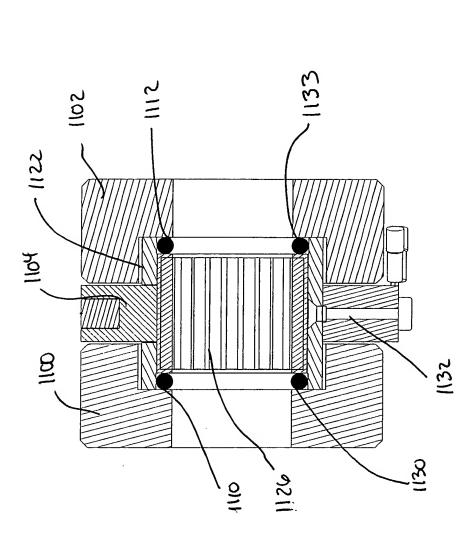


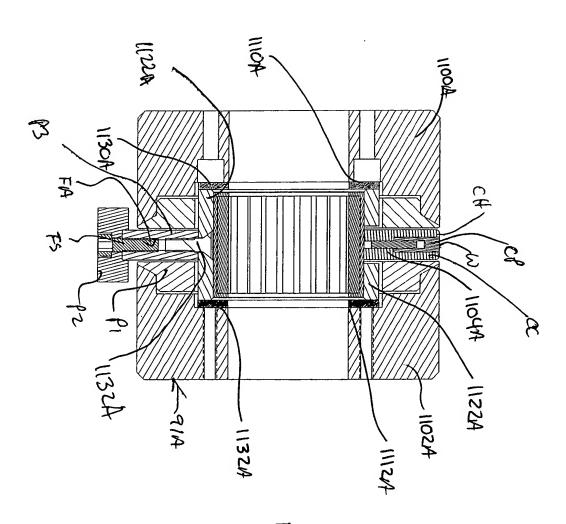


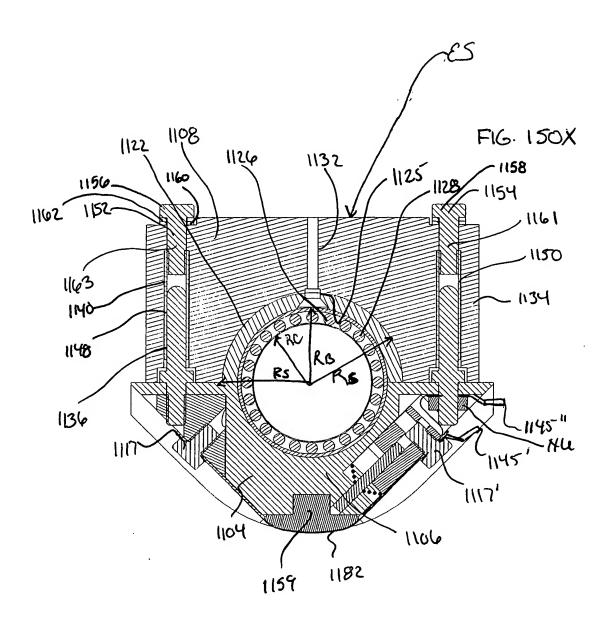


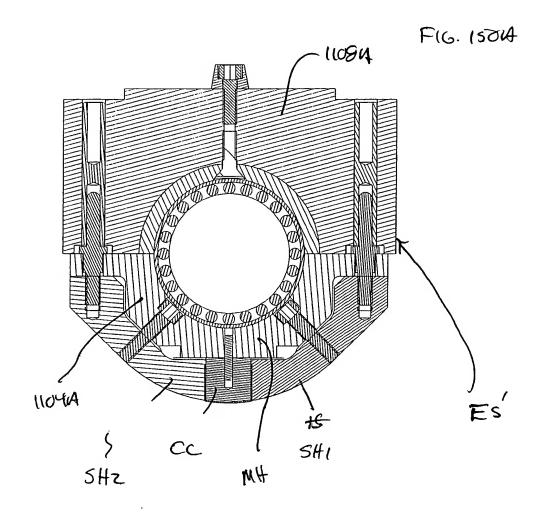


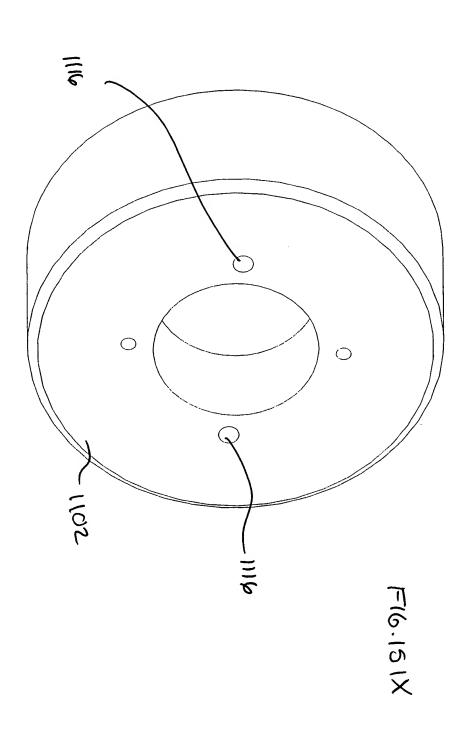
-16. 149X

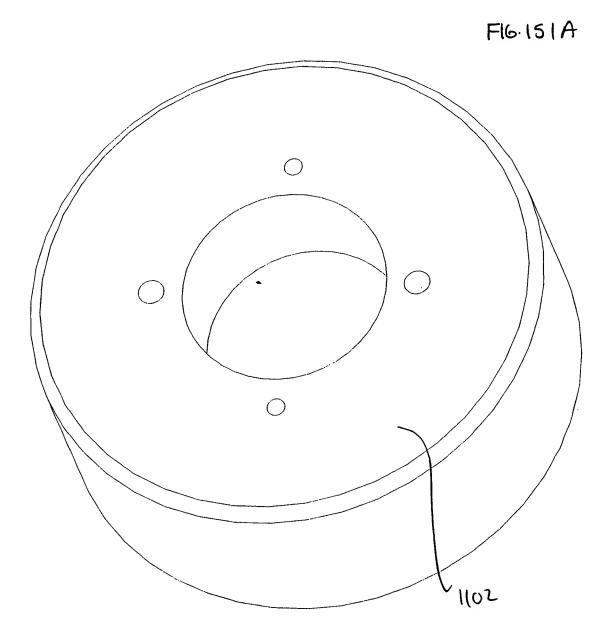


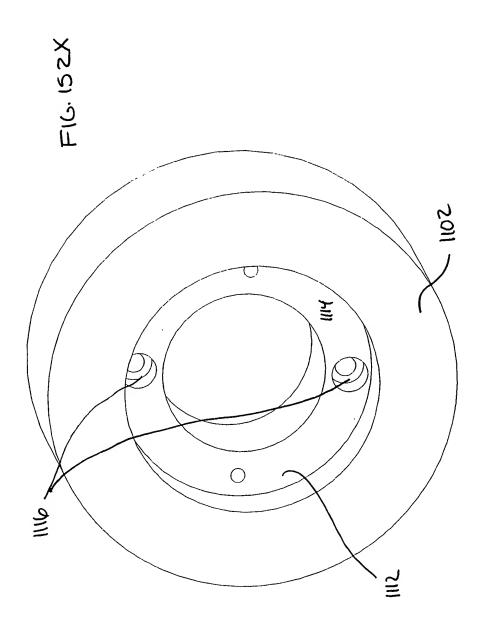


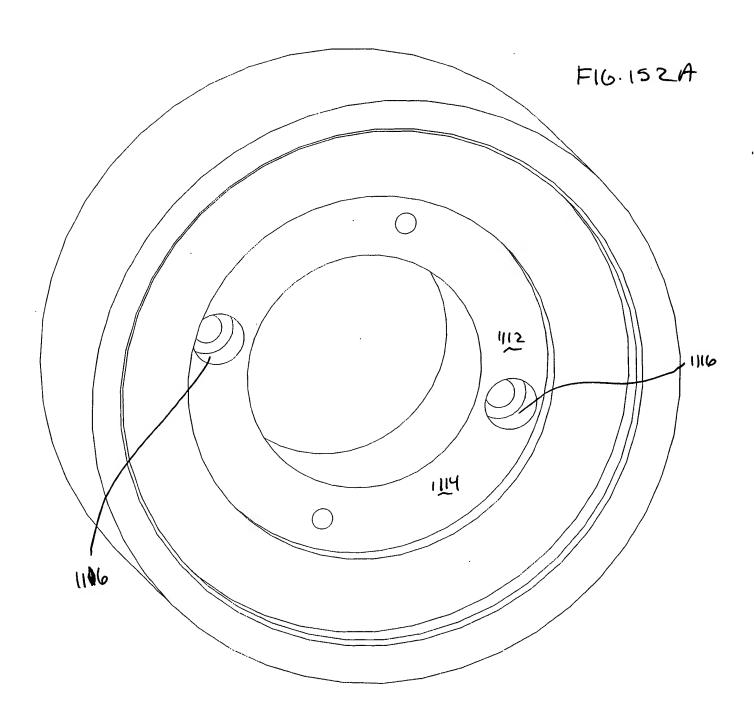


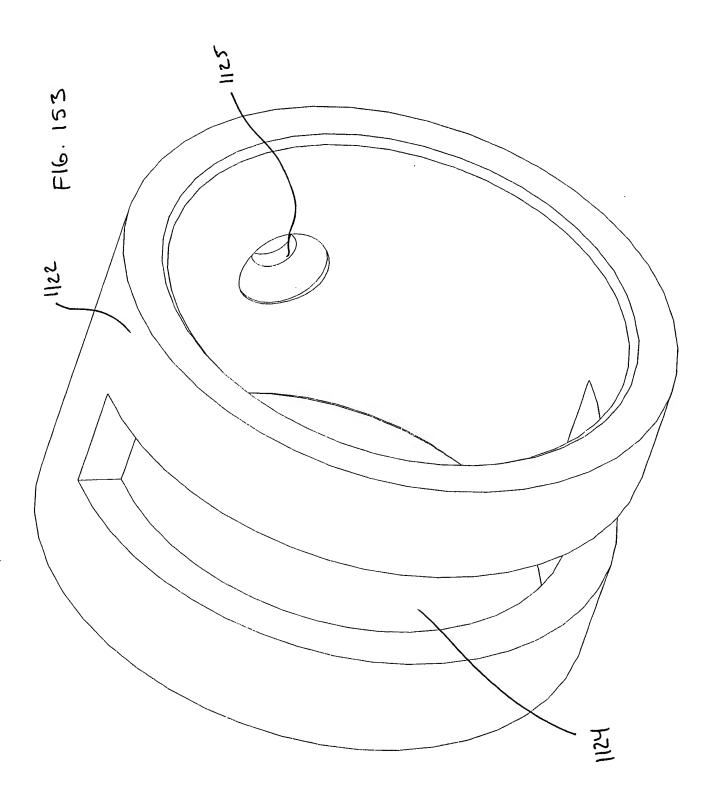


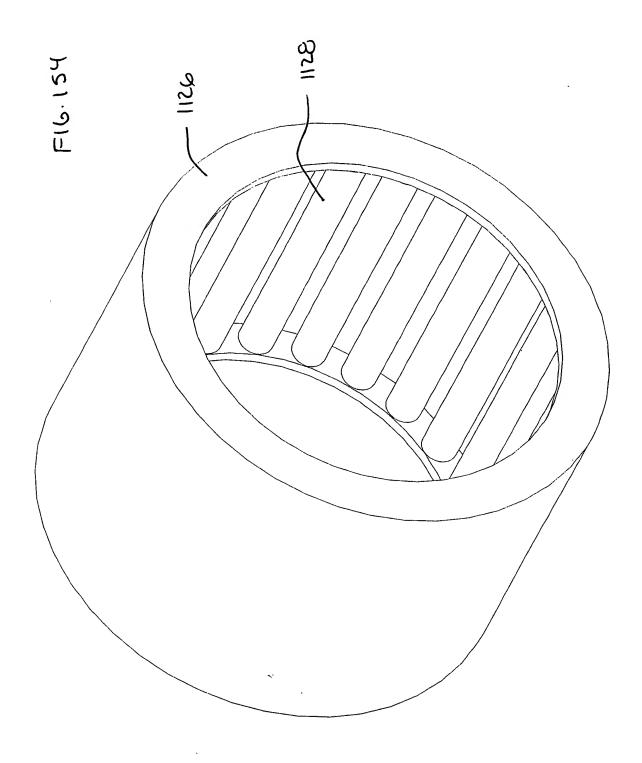




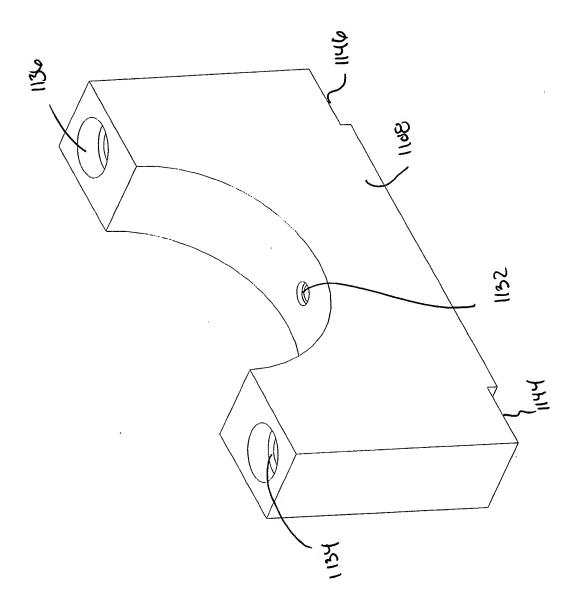


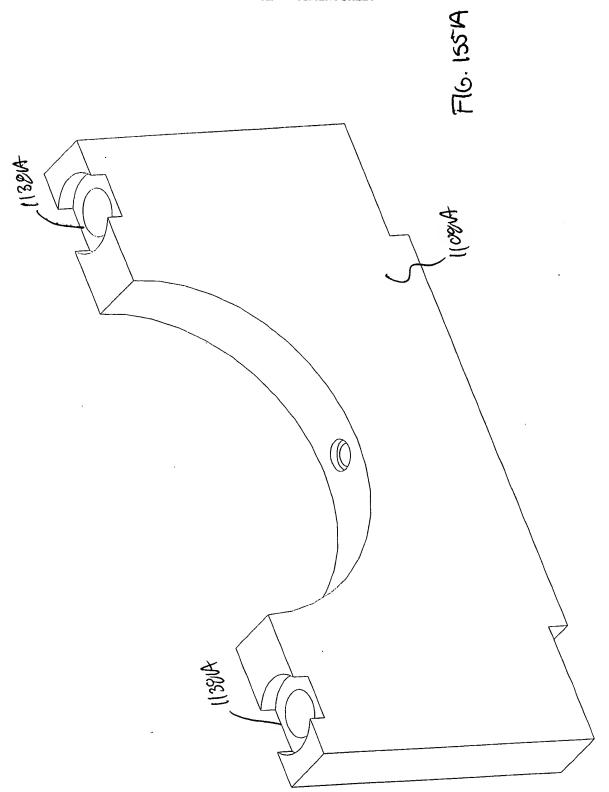


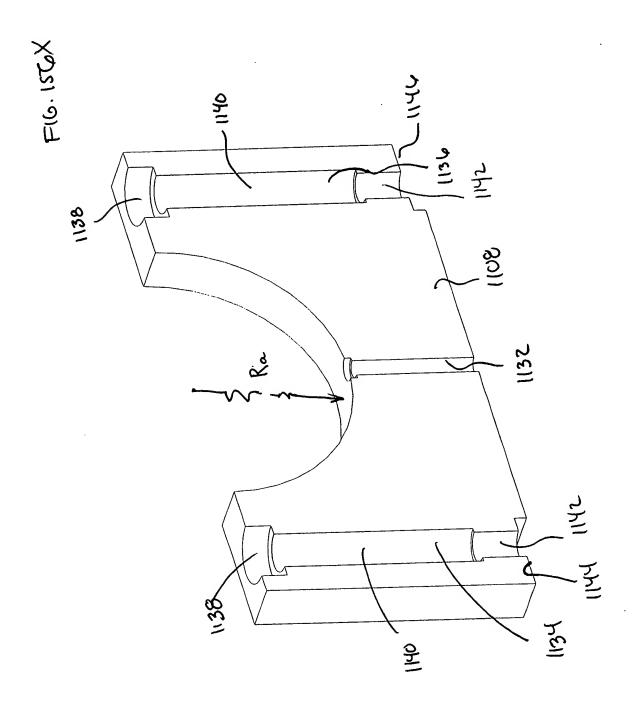


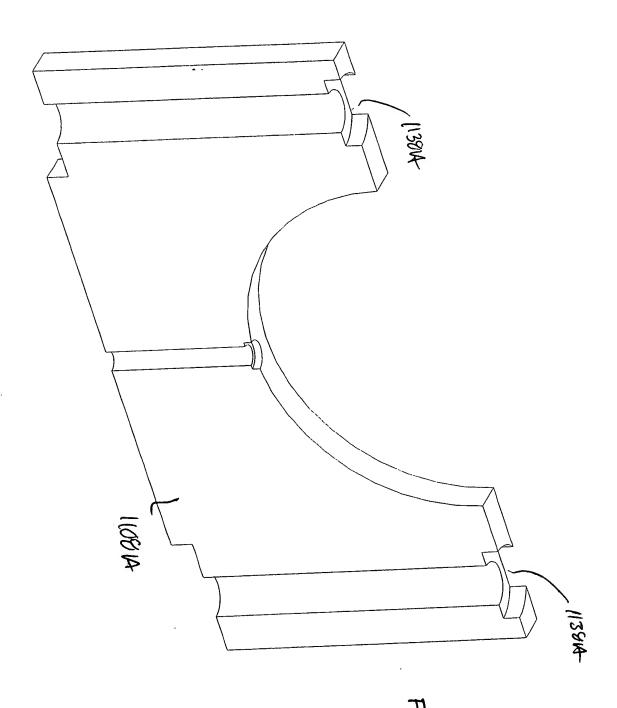


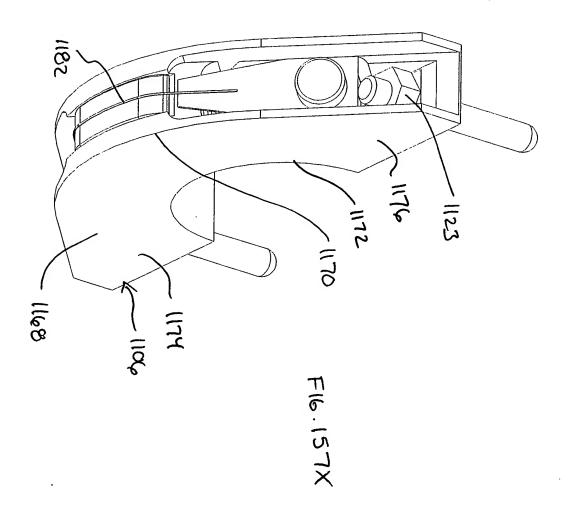
F16. 155'X



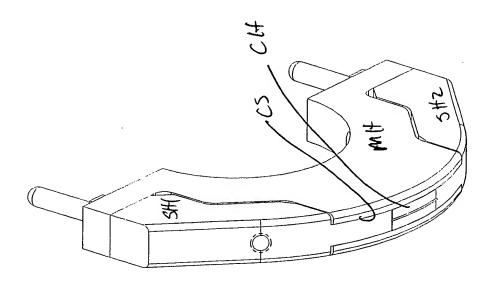


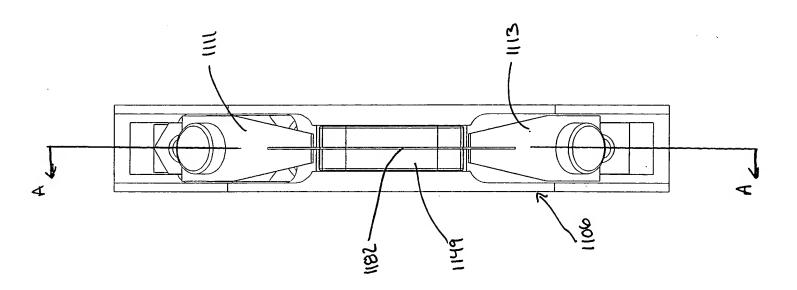


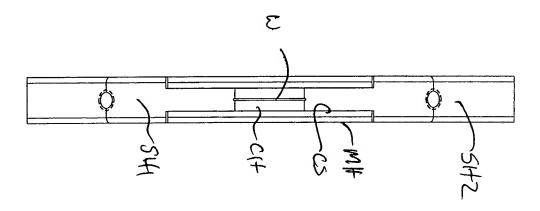


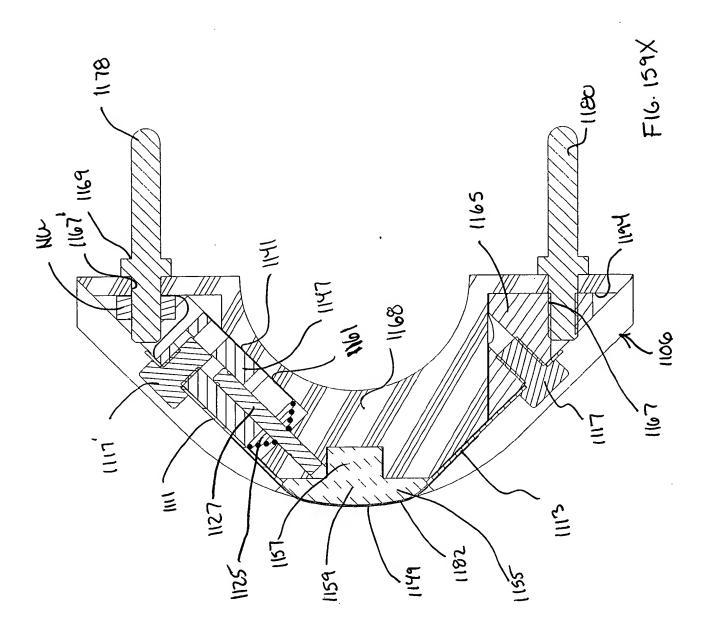


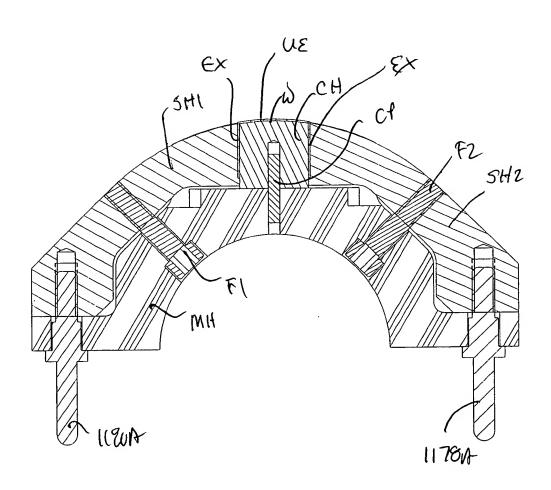
F16-157A



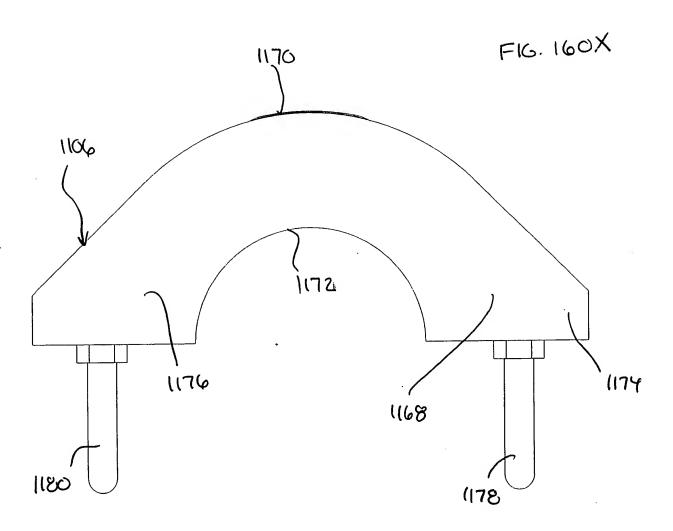




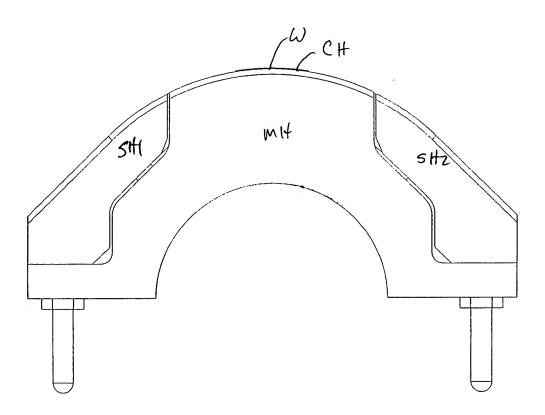


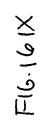


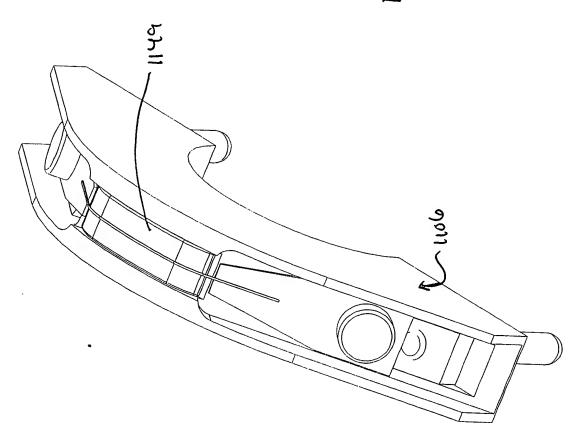
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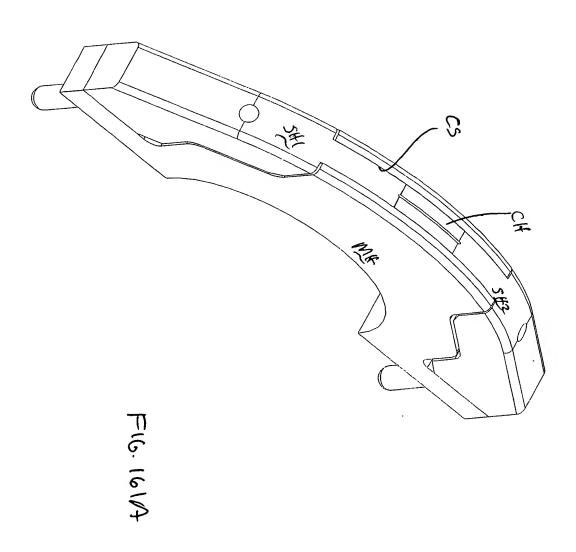


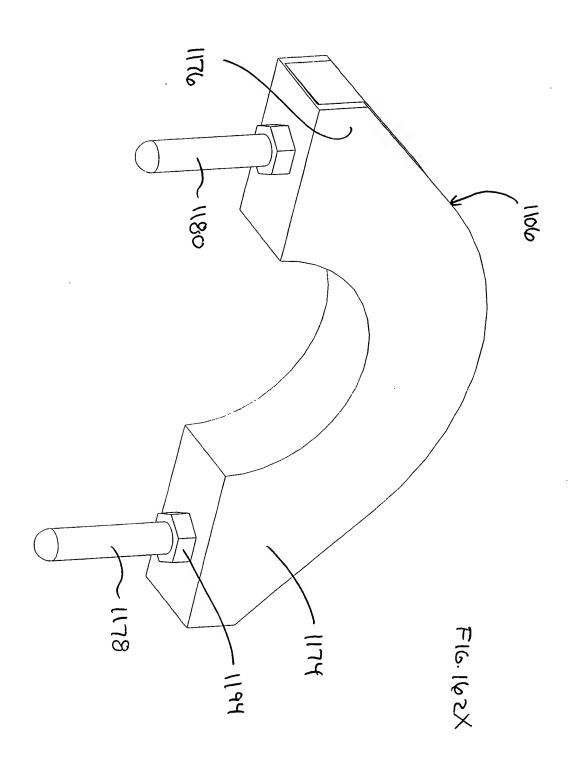
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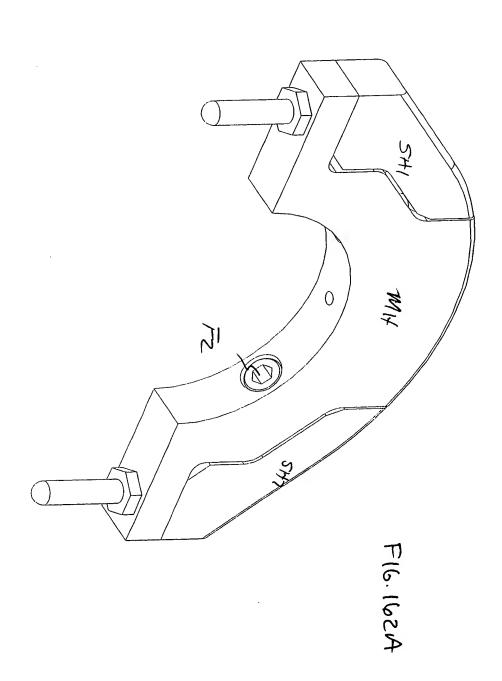


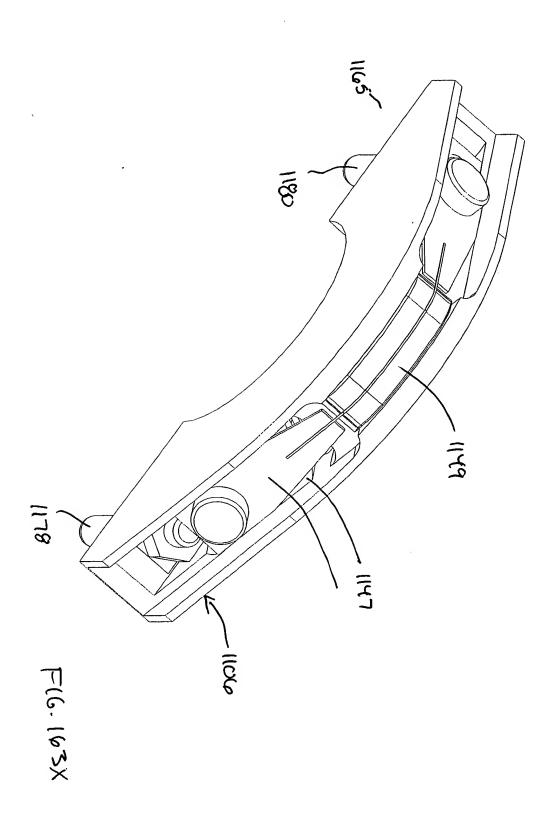


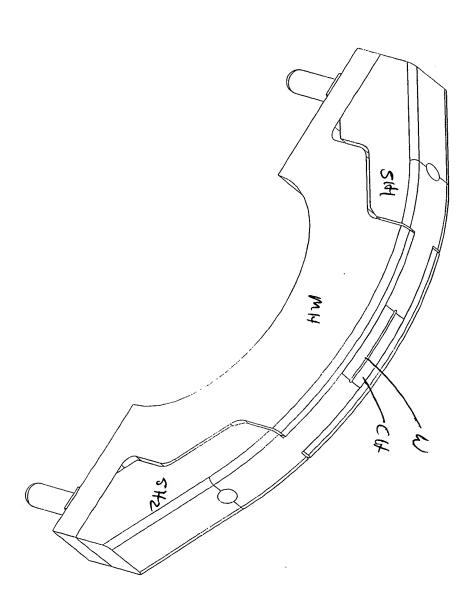


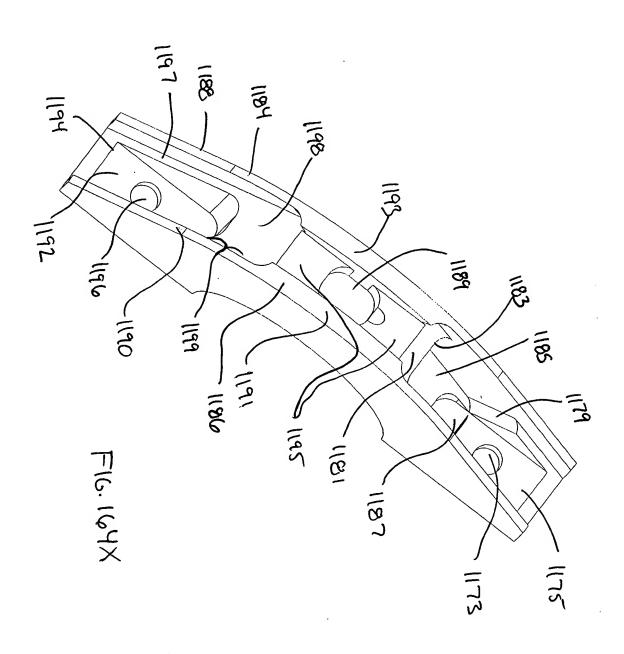


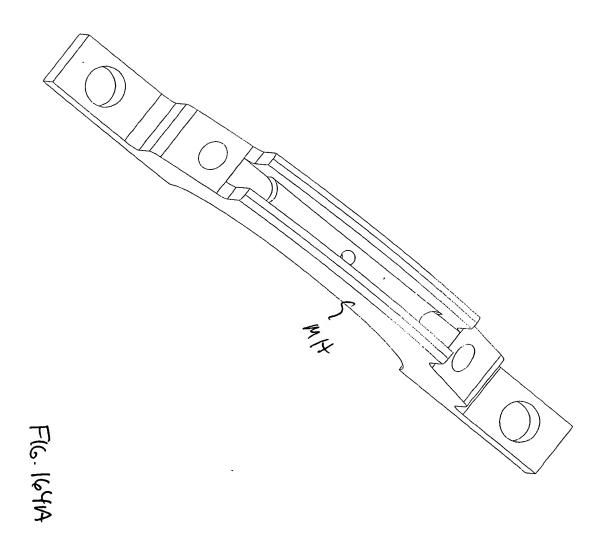


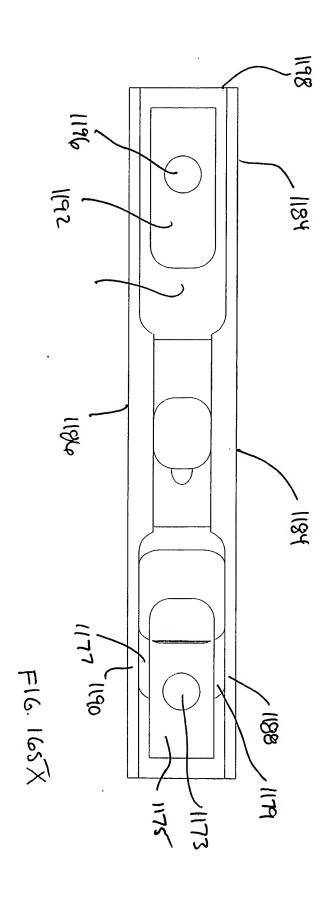


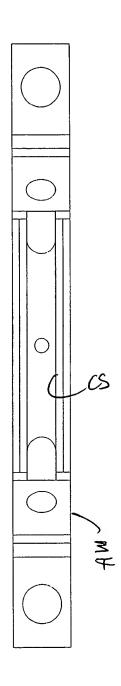




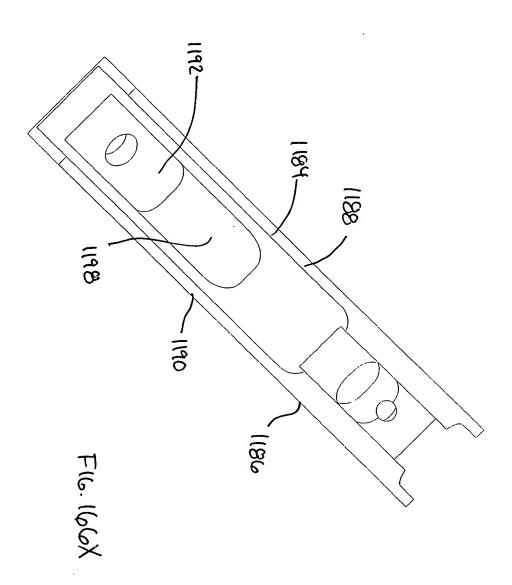


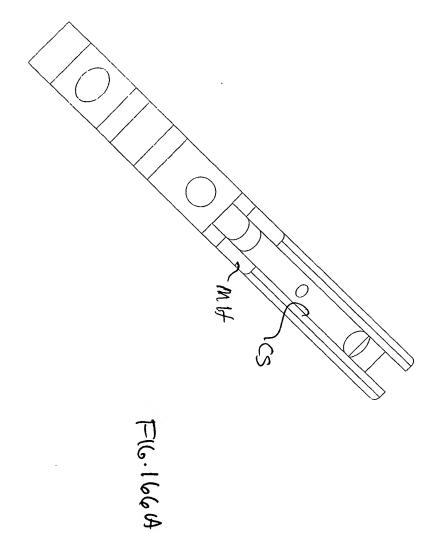


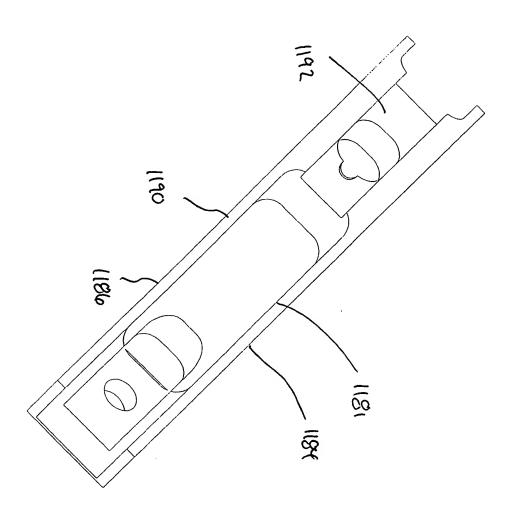




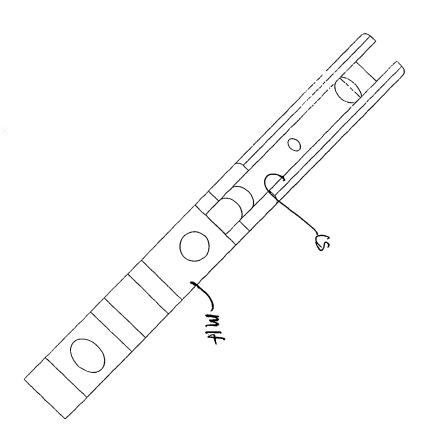
F16.165A



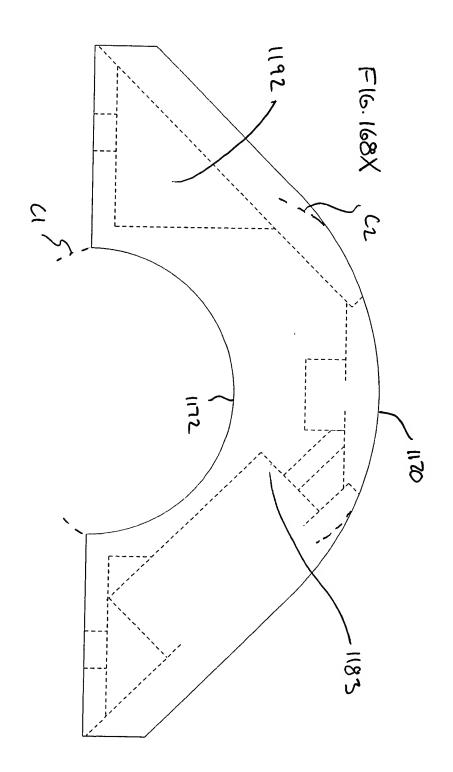


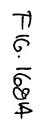


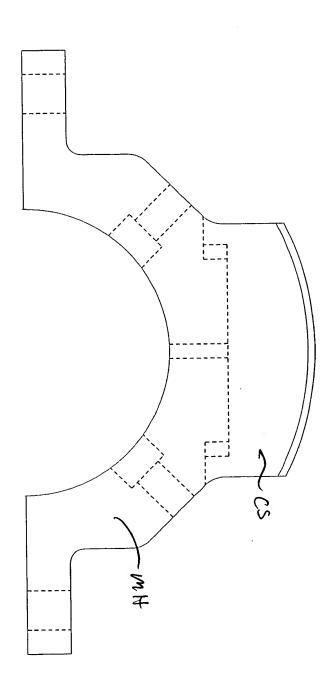
F16. 167X

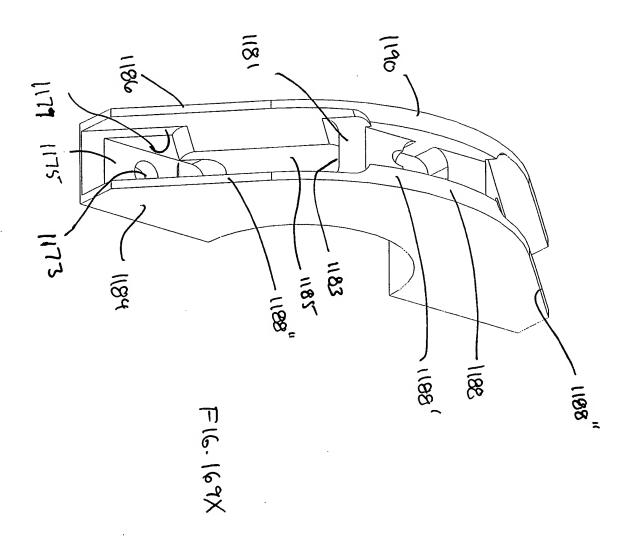


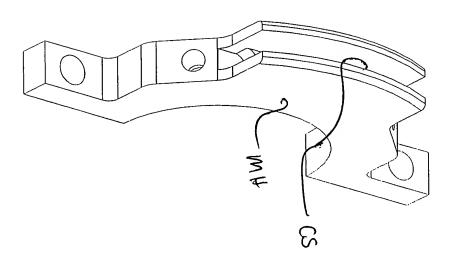
F16. 1674

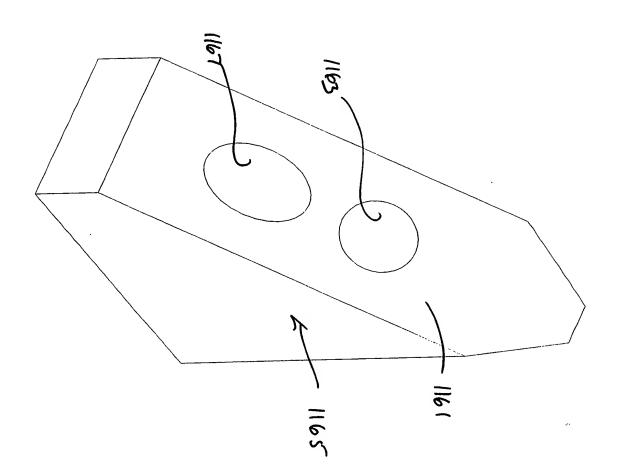


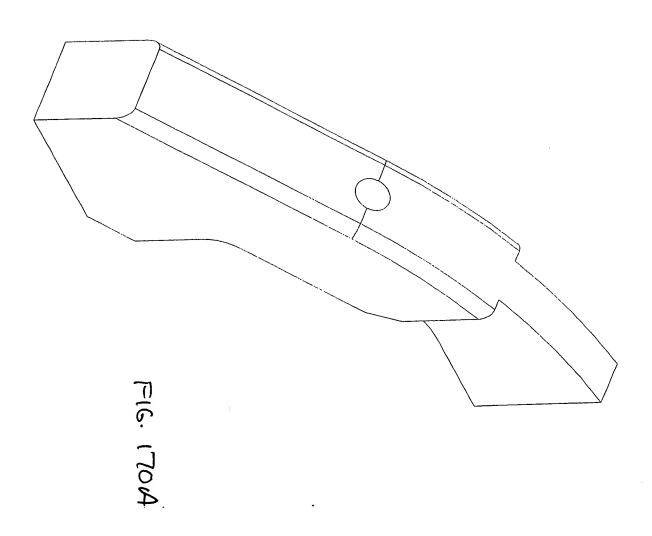


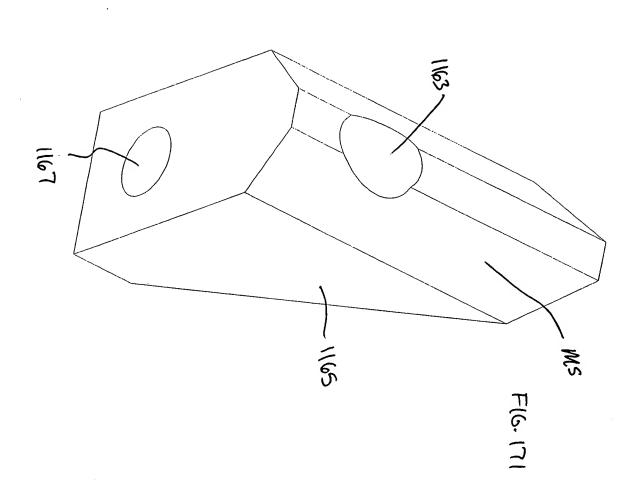












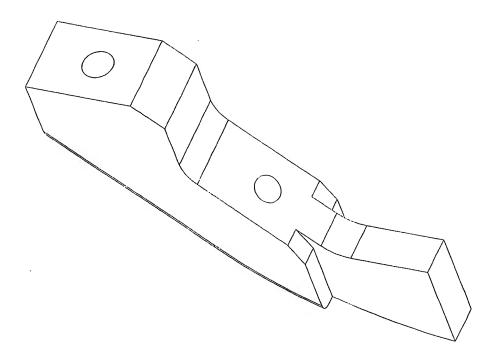
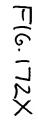
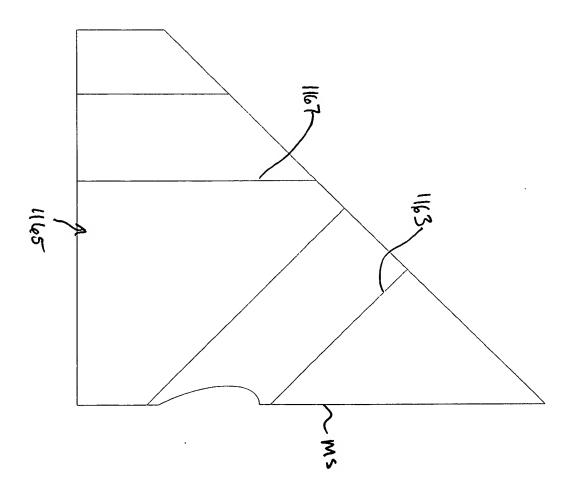
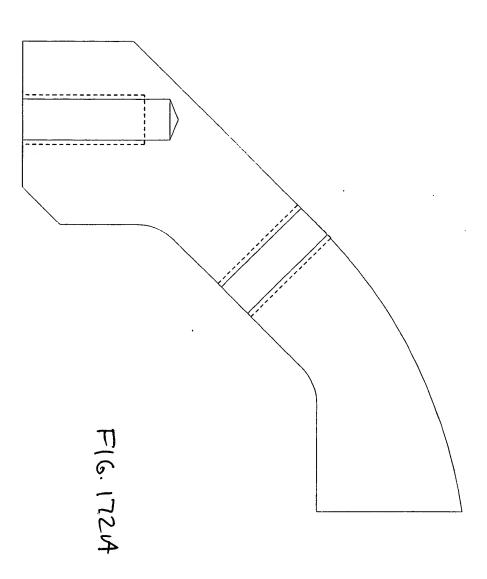
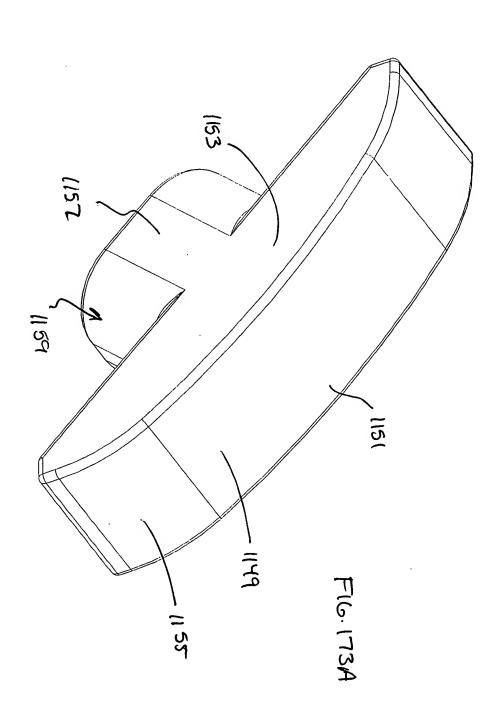


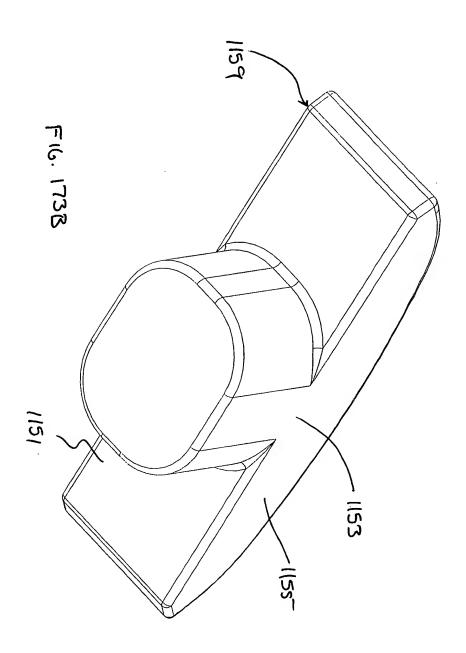
FIG. 171A











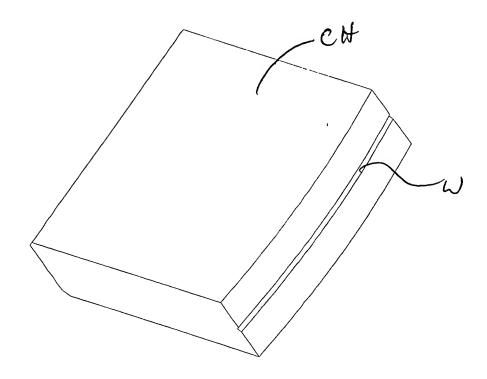


FIG. 173C

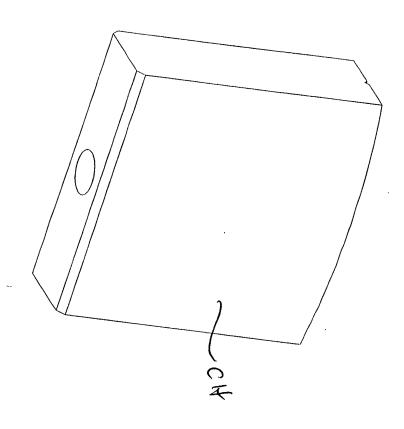
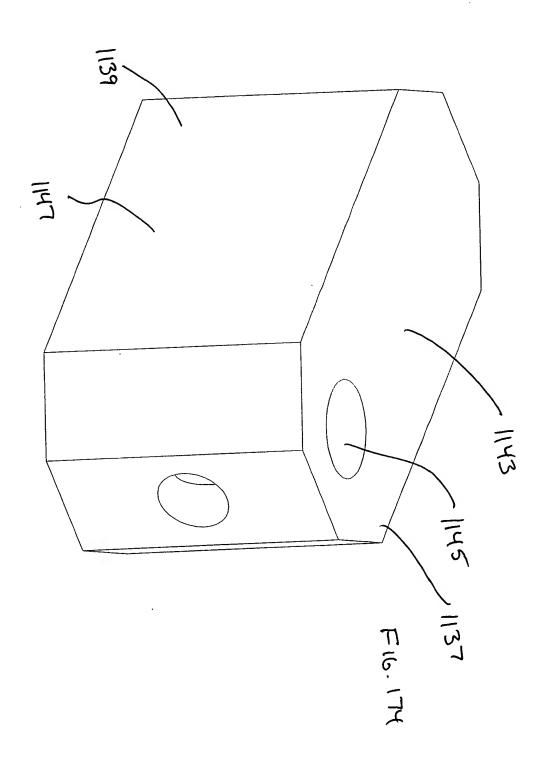
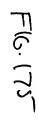
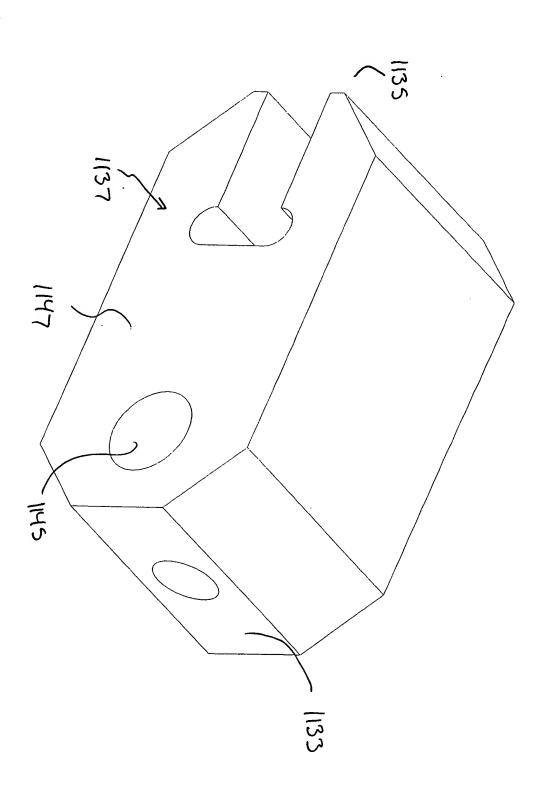
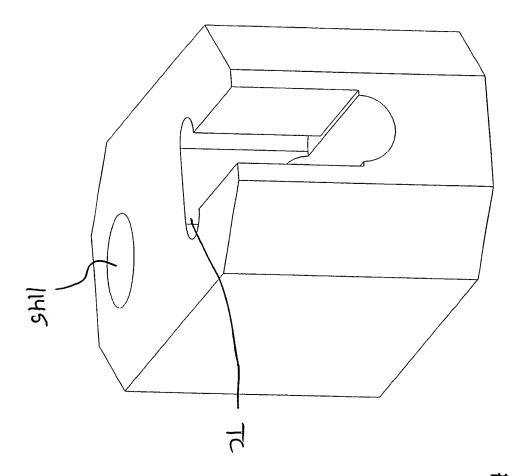


FIG. 173D

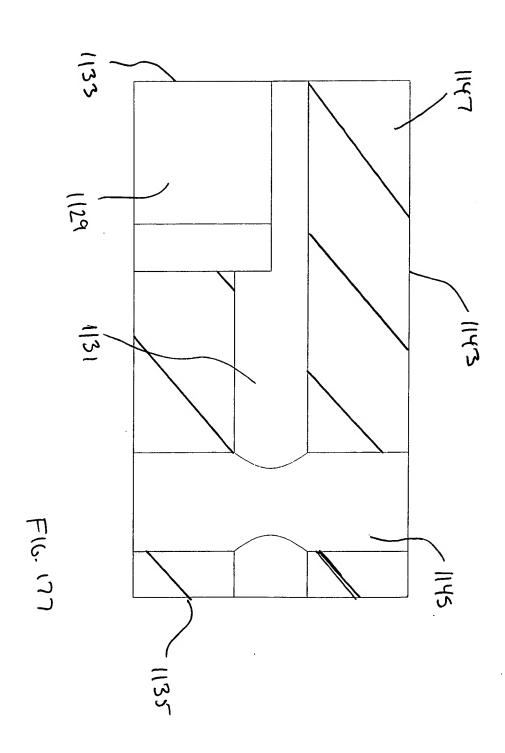


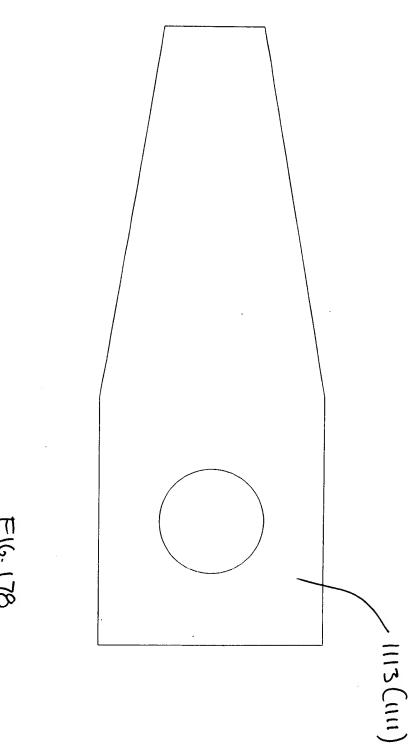


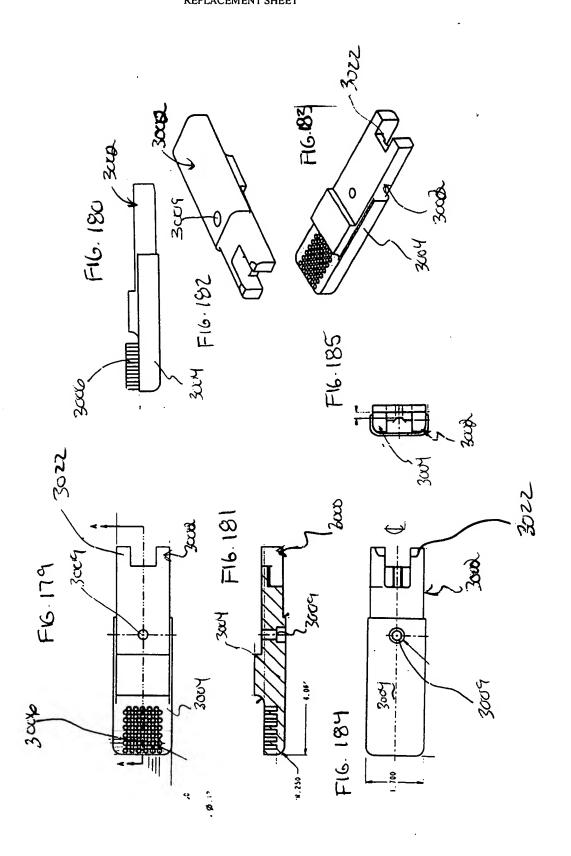


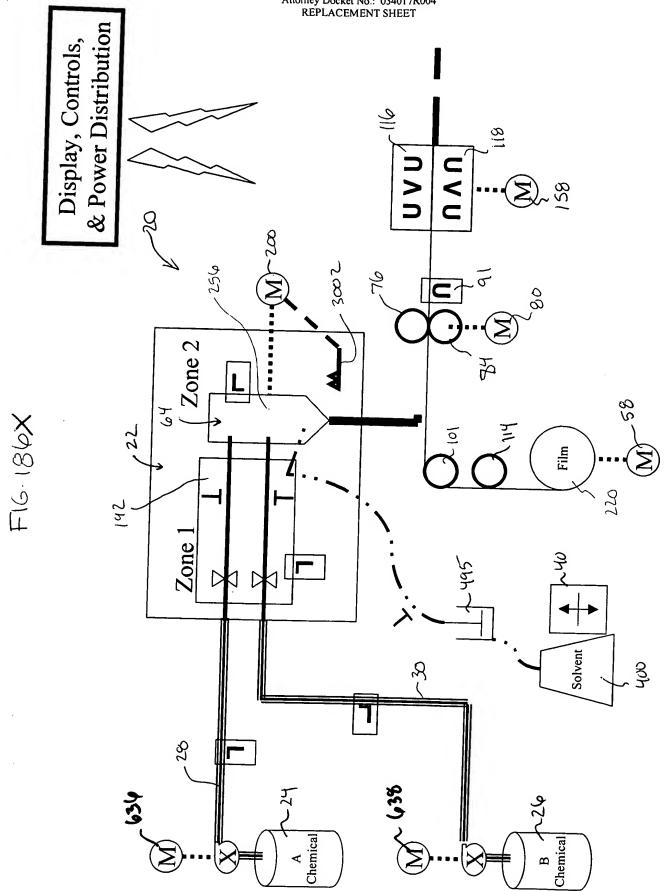


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Inventor: George BERTRAM Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

Attorney Docket No.: 034017R004 REPLACEMENT SHEET

egend

F16. 1864



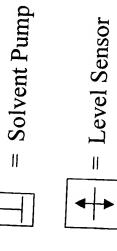
(M) = Motor

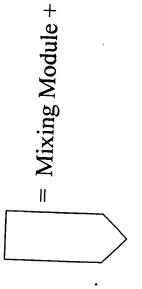
= Linkage



= Pump Shaft/Hose

$$X = Filter$$

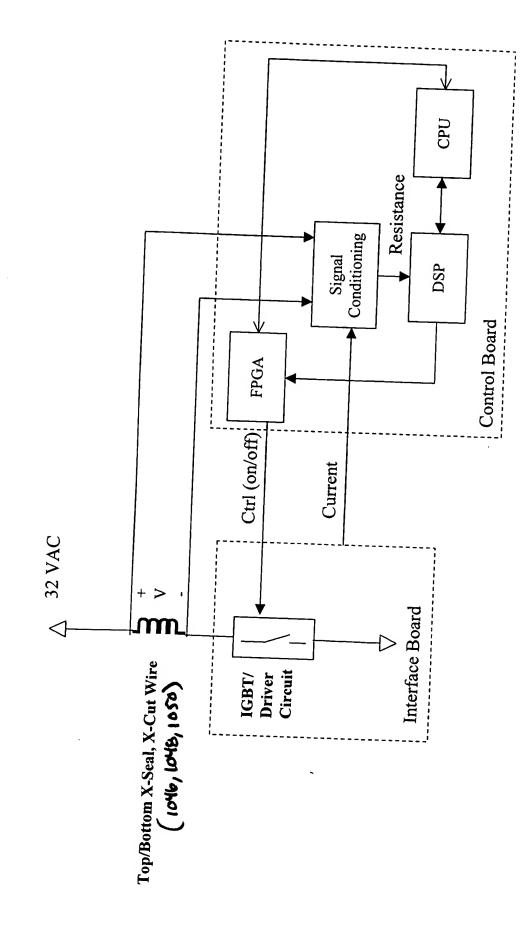


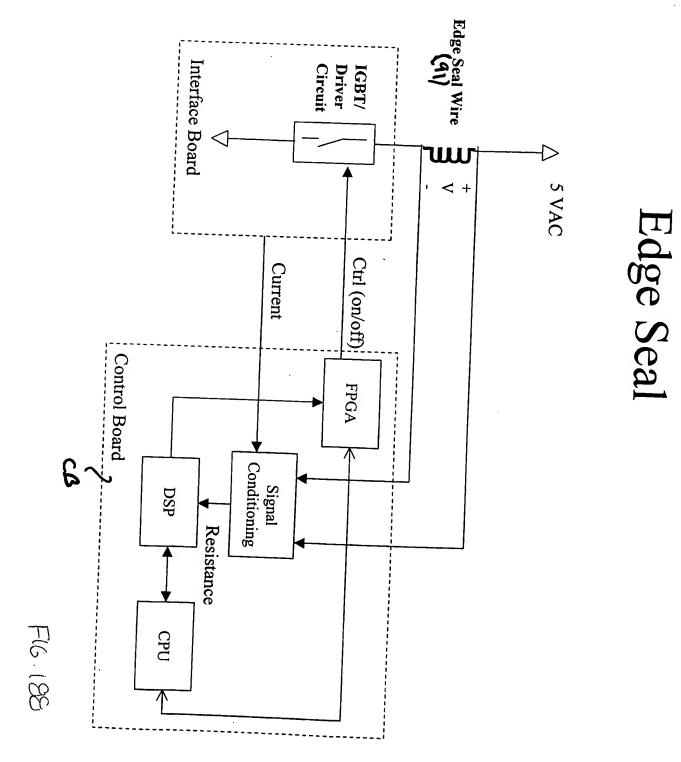


$$\bigcirc = Idler Roller$$

$$\bigotimes = \text{Nip Rollers}$$

Top/Bottom X-Seal, X-cut



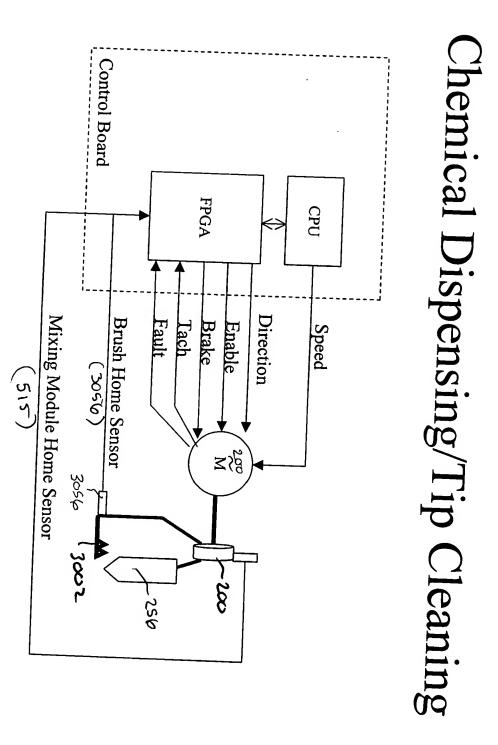


Control Board

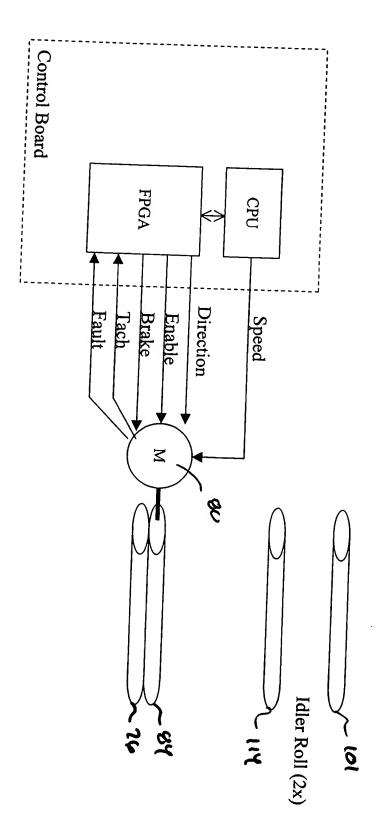
Home Sensor

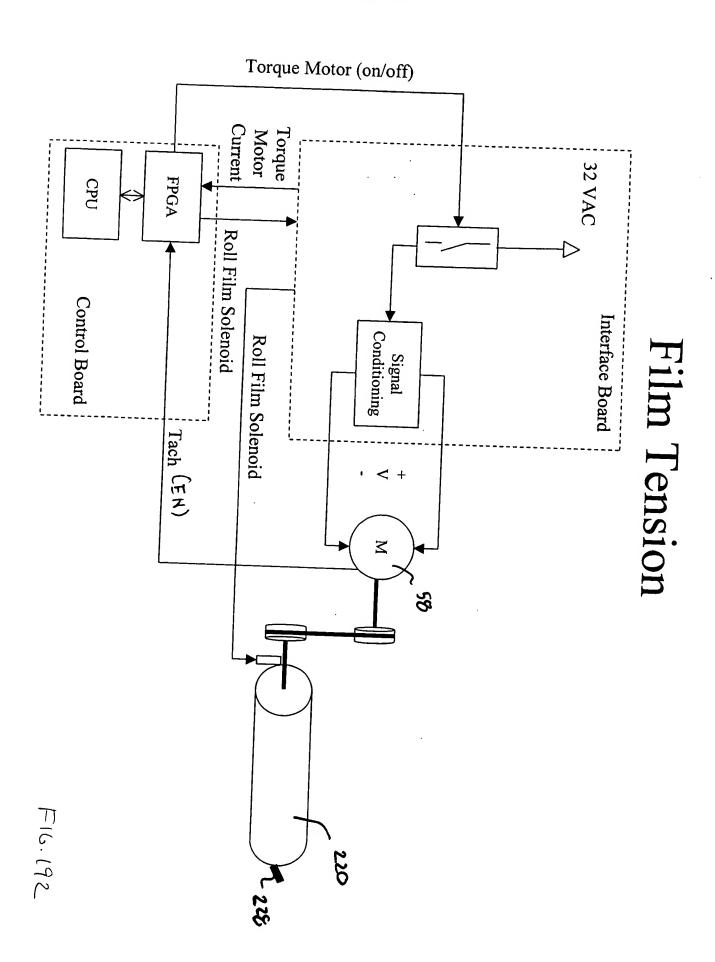
FPGA CPU Moving Jaw Direction Tach Fault Brake Enable Speed

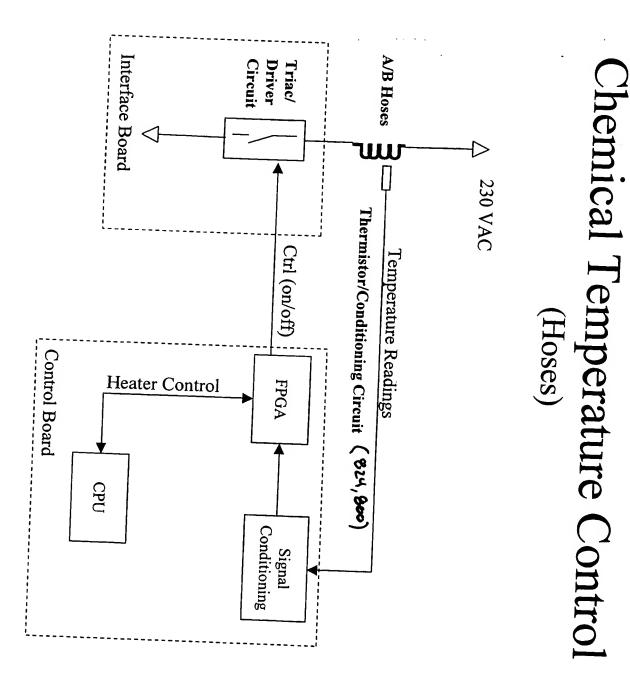
Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM Attorney Docket No.: 034017R004 REPLACEMENT SHEET



Film Advance/Tracking

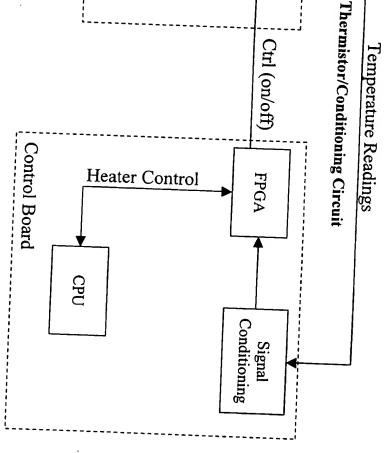






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Driver Circuit Triac/ Chemical Temperature Control Zone 1 Zone 2 w 32 VAC Manifold Zones)

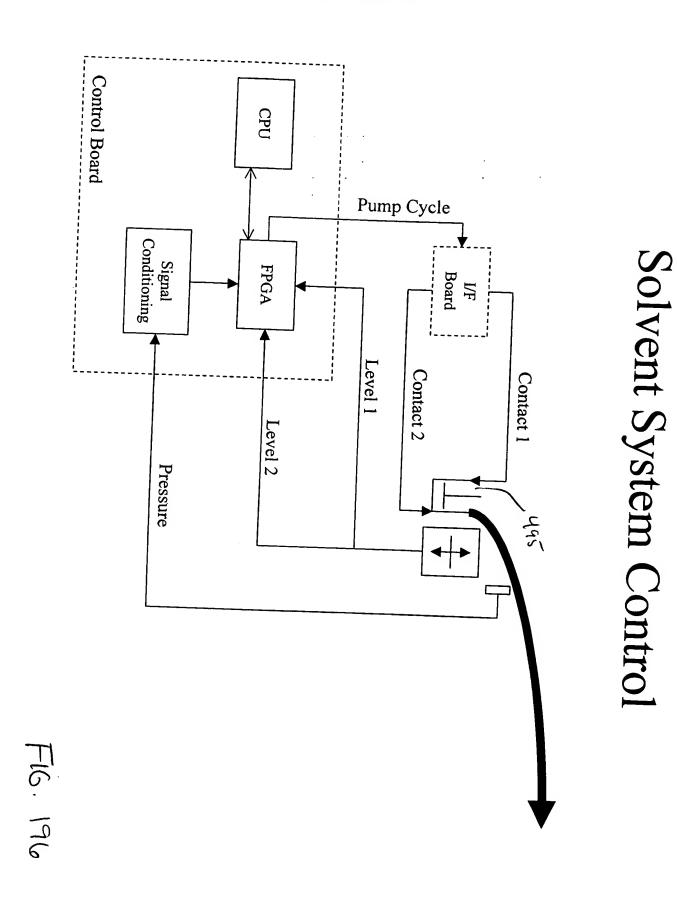


Interface Board

Conditioning Control Board Signal **FPGA** CPU RS485 Tach Brushless Board Driver Pressure V (3-phase) Tach Z (32) Zone 1 Zone 2

Chemical Pressure

1-16.195

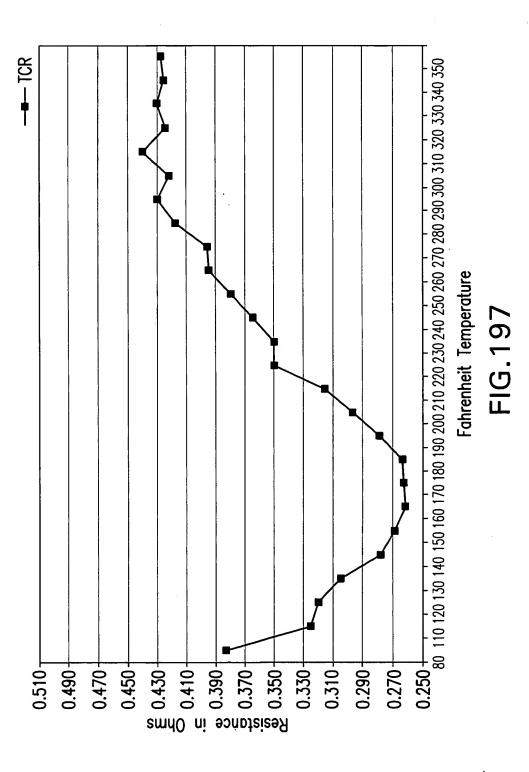


U.S. Patent Application Serial No. 10/798,897

Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM Attorney Docket No.: 034017R004

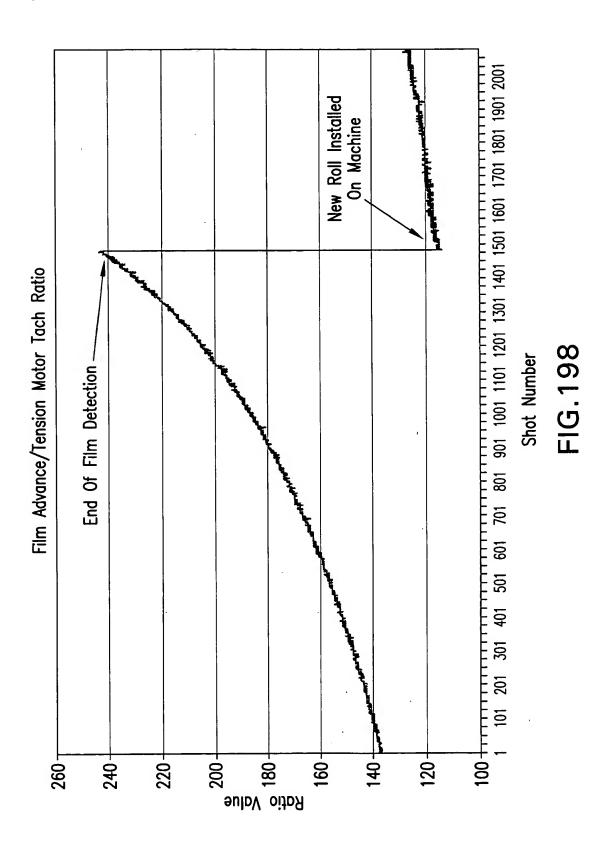
REPLACEMENT SHEET

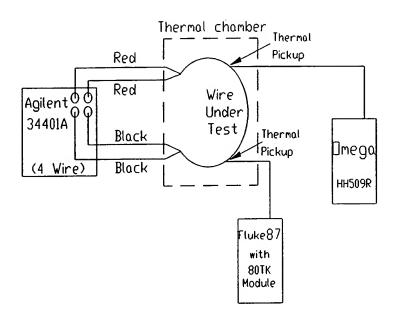


U.S. Patent Application Serial No. 10/798,897 Inventor: George BERTRAM

Title: DISPENSING SYSTEM WITH IN LINE CHEMICAL PUMP SYSTEM

Attorney Docket No.: 034017R004 REPLACEMENT SHEET





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